the OIL AND GAS JOURNAL

BUILT FOR *DEPENDABLE* SERVICE WHERE DURABILITY IS A "MUST"

Walworth Lubricated Plug Valves assure tight Shut-Off . . . Eas[illegible]ion

No. 1670F Flanged

No. 1670WE Welding Ends

Walworth Steel Ball Bearing Lubricated Plug Valves . . . 1000 Pound WOG . . . Venturi Pattern – Worm Gear Operated

Walworth manufactures a complete line of Lubricated Plug Valves in sizes from ⅛" to 30" for pressures from 125 to 5,000 psi. water, oil, or gas; and for vacuum requirements. These valves are designed and engineered for specific service requirements in the production, refining and distribution of petroleum products.

For full information concerning the complete line of Walworth Lubricated Plug Valves, see your Walworth distributor, or write today for your free copy of Walworth Catalog 46L.

WALWORTH valves and fittings
60 EAST 42nd STREET, NEW YORK 17, N. Y.

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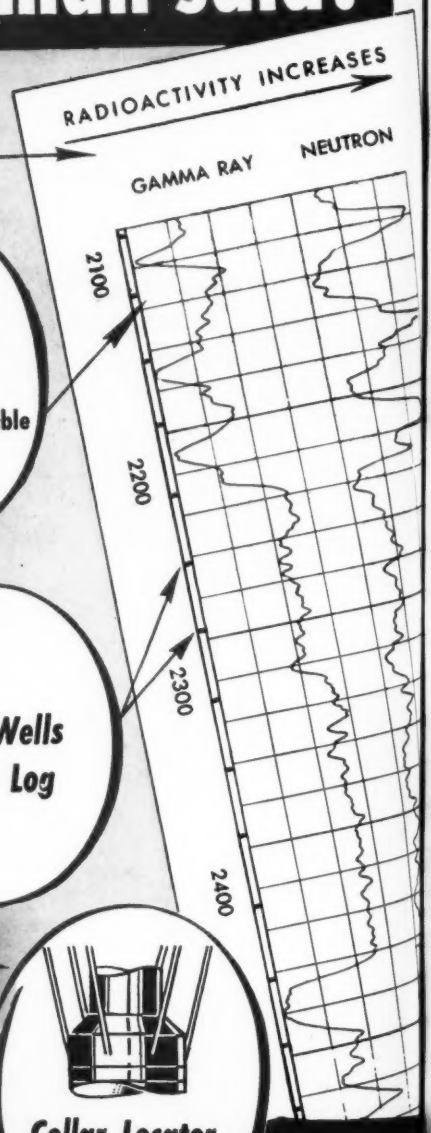
TEXAS TECHNOLOGICAL COLLEGE

AUG 19 1952

THAT'S what the man said!

* Probably the most important single tool in workovers is the radioactivity log. The combination Gamma-Ray-Neutron Log is the only way we have of locating oil sands which have been cased off, either intentionally or because they were not recognized at time of drilling. An important feature of such a log is that formation depths can be determined relative to casing collars, eliminating errors due to different measuring devices or to confusion of different reference points. This establishment of fixed, immovable reference points with respect to formations assures a completion as desired, since a gun perforator with 'feelers' will pick up the collars.

Radioactivity well logs have their limitations: they are difficult to interpret and correlate, hence, experience is the crowning asset in rendering decisions from Gamma-Ray-Neutron Surveys.



Radioactivity Well Logging provides the only complete record possible through casing.

Lane-Wells Collar Log

Collar Locator on a Lane-Wells Gun-Perforator

* *Condensed from a magazine article by a petroleum engineer with one of the major oil companies.*

LANE WELLS COMPANY

TECHNICAL OIL FIELD SERVICES

GENERAL OFFICES, EXPORT OFFICES AND PLANT
5610 SO. SOTO STREET, LOS ANGELES 11, CALIFORNIA
24 HOUR SERVICE • 49 BRANCHES

has made 15,000 Radioactivity Well Log

He'll help you avoid crushed rope

IWRC

An independent wire rope core gives added support to the strands which lie around it.

In many types of wire-rope service, heavy pressures on the rope itself are unavoidable. The Bethlehem man knows, for instance, that even with the best of spooling, a fiber-cored wire rope is sometimes crushed on the drum. Often, too, loads are so heavy that great pressures exist as the rope passes around sheaves. These pressures frequently have a distorting effect on the wire structure of the rope.

When such conditions exist, the Bethlehem field engineer can usually spot them. Then he'll generally recommend rope with an IWRC (independent wire rope core). The IWRC is made entirely of steel wires and takes the place of the usual fiber core. Being all-steel, it naturally gives better support to the strands of the rope proper. Thus, to a large extent, heavy outer pressures are counteracted; the chances of crushing or distorting the rope are greatly reduced.

It's a good idea to have the Bethlehem field man look over your equipment, to see whether you need rope with IWRC. He will recommend it only where needed. In many cases, IWRC lowers costs substantially by greatly prolonging rope life.

Any time the Bethlehem man can help you—with this or other wire-rope problems—ask him to pay you a visit. He's always glad to, and there is never any charge for his services, no matter how much time he spends with you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1948.

Only IN W-K-M VALVES

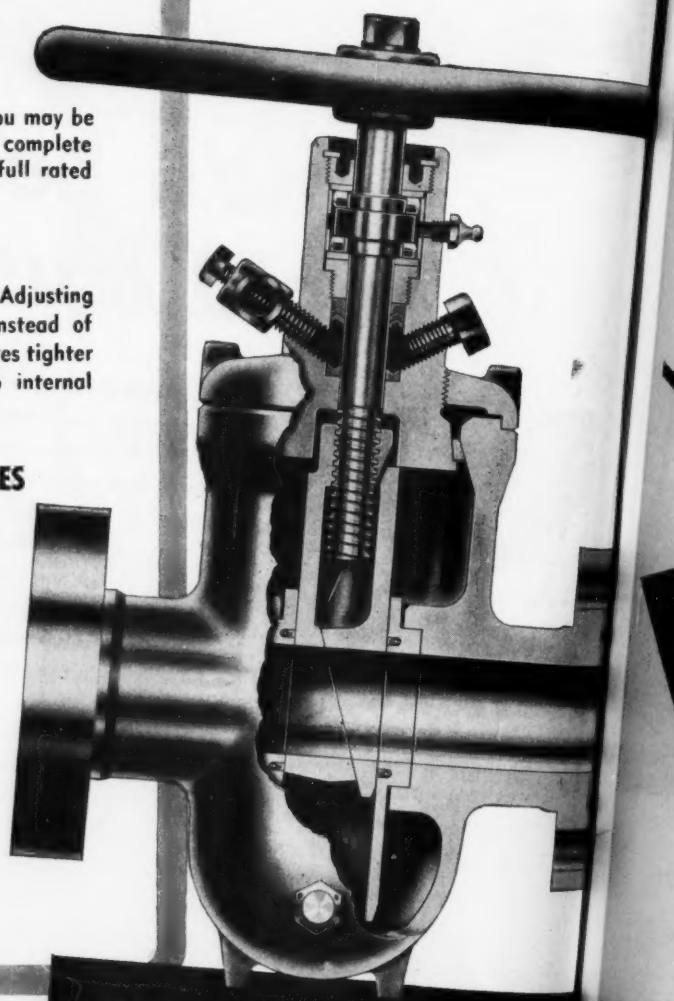
THESE OVERSIZE BRONZE RENEWABLE SEATS WITH COMBINATION WIPE AND SEAL RING

These oversized, skirted bronze seats provide an unusually large bearing surface for the parallel expanding gate, which means more sealing area.

They serve as guides for the full travel of the gate and also carry the spring actuated, triple acting wiper or sealing rings which keep the gate clean, prevent loss of grease from the body and also provide still another effective seal against pressure.

Because the area of these seats is considerably more than that area of the gate exposed to pressure, renewal is seldom necessary. However, because they are renewable, they may . . . like other parts of the valve . . . be changed on the lease, and if desired, without removing the valve from the line.

This is another of the several reasons why you may be sure that a W-K-M Valve will always effect a complete shut-off . . will always open or close under full rated pressure



PRESSURE SEAL BONNET

Requires no flanges—no studs and nuts. Self-Adjusting to pressure and temperature changes . . . instead of tending to push bonnet off, greater pressure gives tighter seal . . . considerably less area exposed to internal pressure.

PLUS THESE OTHER PROVED FEATURES

- Through-conduit opening—no turbulence —no restriction of flow.
- Lubricant contained in entire body — no special lubricant required — seal does not depend on lubricant
- Parallel expanding gates — seal directly across both seats with no distortion whatever — positive shut off both sides.
- Combination wipe and seal rings keep the gate clean . . . pressure out . . . grease in.
- Chrome plated gates.
- Double roller thrust bearings on stem for ease of operation.
- Combination plastic - chevron packing — uses no gland or gland follower.

THIS IS THE NEW - IMPROVED W-K-M FLOW-LINE AND CHRISTMAS TREE VALVE

W-K-M Company, Inc

OIL FIELD PIPE LINE & INDUSTRIAL EQUIPMENT

HOUSTON, TEXAS, U. S. A.
LOS ANGELES

Cable Address: "WILKOMAC"
Export Office: 30 Rockefeller Plaza, New York, N

a thousand and one job-proved wire ropes

There's a Macwhyte rope
that's the right rope
for your equipment.

Macwhyte Wire Rope

Use PREformed Whyte Strand for easy handling and longer service.

Macwhyte Distributors and Mill Depots—carry stocks for immediate delivery. Macwhyte representatives will recommend the correct rope for your equipment. Catalog on request.

MACWHYTE COMPANY
2916 Fourteenth Avenue • Kenosha, Wisconsin
Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.
Distributors throughout U. S. A. and other countries.

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BUSINESS GO-GETTER!...a company-owned Bonanza

CARDWELL MANUFACTURING COMPANY, INC.

CABLE ADDRESS "ALLSTEEL" WICHITA "CARDSTEEL" NEW YORK
TELEPHONE L. D. 129 P. O. BOX 2001

WICHITA 1, KANSAS

WHEN REPLYING PLEASE REFER TO DEPARTMENT NO

September 20, 1948

Mr. Walter H. Beech
Beech Aircraft Corporation
Wichita, Kansas.

Dear Mr. Beech:

We are the largest manufacturer of shallow and medium depth oil well drilling and servicing equipment, and naturally our executives and engineers like to spend as much time as possible in the field checking on the operation of our new developments.

In order to spend maximum time on such trips and waste the minimum time in travel to dozens of scattered locations, we recently purchased a Beechcraft Bonanza. This purchase lets us do just that.

The other day we wanted to check on the operation of one of our new "Cardwell" Trailerigs operating in Wyoming, 550 miles from Wichita. We flew over, landed on a road not far from the rig, spent the whole day in the oil fields and were back home the same day. Figure it out - 1100 pleasant flying miles, and a seven-and-a-half hour day getting the information we needed. The Bonanza lets us do business the way we want to!

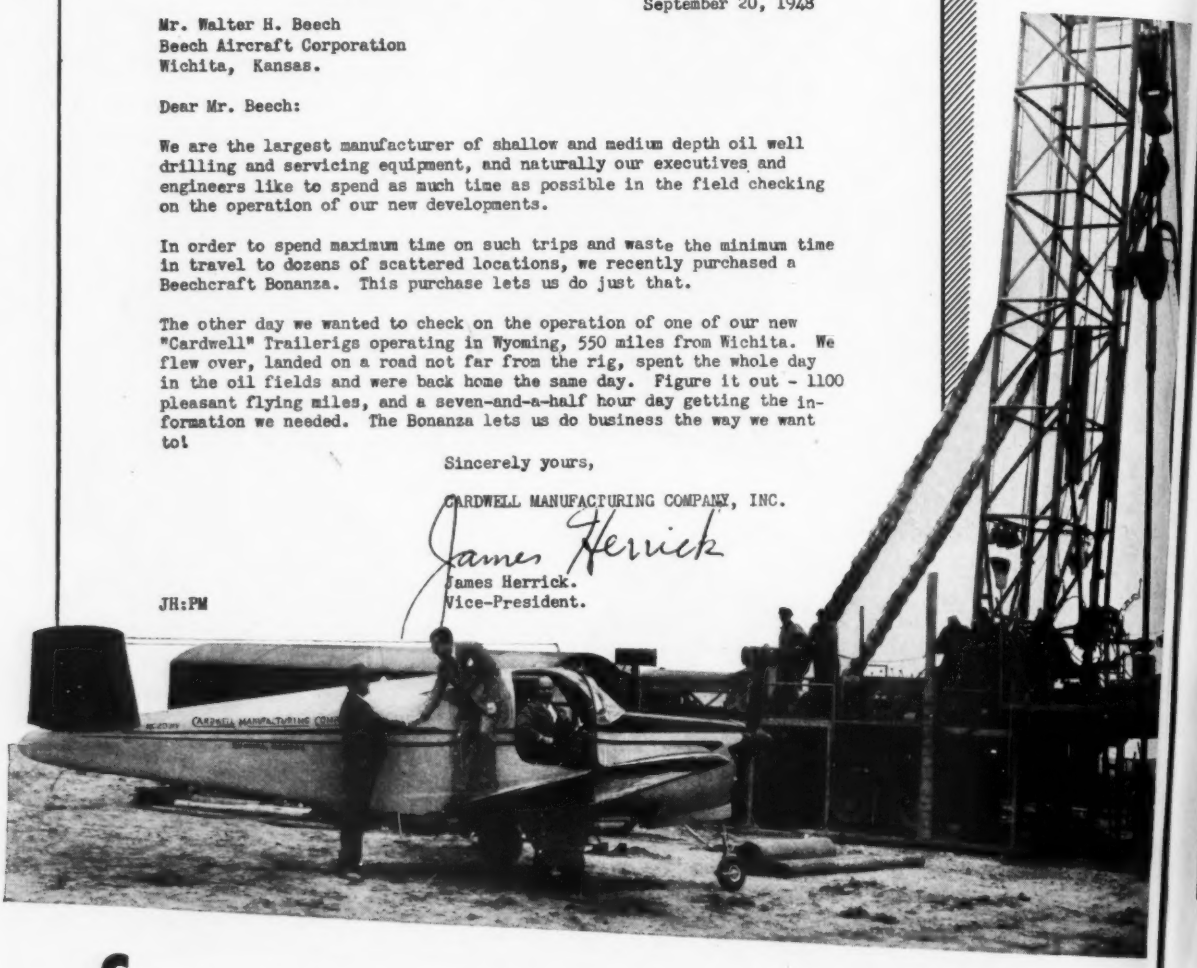
Sincerely yours,

CARDWELL MANUFACTURING COMPANY, INC.

James Herrick

James Herrick.
Vice-President.

JH:PM



Company-ownership of this exceptionally fast *comfortable* 4-place Bonanza simply means you increase your business potential. For the Bonanza cuts your travel time by two-thirds—time saved that you put to profitable use. And because you have complete mobility of action, you can take advantage of all the opportunities that arise. You keep abreast of home office work, too—because you're back in hours, not days. Pennies-per-mile operating economy. Investigate.

● A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

Top speed, 184 mph
Cruising speed, 170 mph
Range, 750 miles

BEECHCRAFT
BONANZA
MODEL A35

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Fills Every Need for V-Belt Drives!

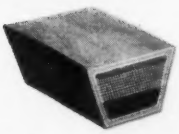
TEXROPE
Greatest Name in V-Belt Drives

***TEXDRIVE* SHEAVES**
Cast Iron with 1 to 6 grooves for A and B belts. 1 to 25 h. p. *All sizes from stock.*

***VARI-PITCH* WIDE RANGE SHEAVES**
Speed range up to 100%. 1 to 4 grooves, Q and R belts, fractional to 30 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*

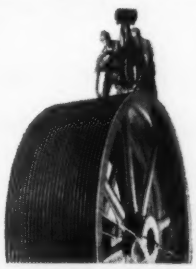
***TEXSTEEL* SHEAVES**
Welded pressed steel with rolled edges. 1 to 6 grooves, A or B belts, ¼ to 25 horsepower. *All sizes from stock.*

STANDARD CAST IRON SHEAVES
Made to order from stock patterns. 1 to 14 grooves, A, B, C, D, or E belts, 1 to 1000 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*



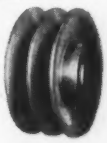
***TEXROPE* SUPER-7 V-BELTS**
Wide range of types, sizes and sections to suit all operating conditions. *All standard sizes from stock.*

***MAGIC-GRIP* SHEAVES**
Semi-steel with patented taper bushing. On and off in a jiffy. 2 to 12 grooves, B, C, or D belts, 2 to 250 horsepower. *All sizes from stock.*

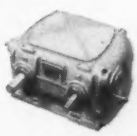


SPECIAL CAST IRON AND STEEL SHEAVES
Any number of grooves for A, B, C, D, or E belts. Up to 6000 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*

***TEX-IRON* SHEAVES**
Light weight single groove sheave for fractional horsepower applications. *All sizes from stock.*



***VARI-PITCH* STANDARD SHEAVES**
Speed range 9% to 28%. 2 to 10 grooves, A, B, C, D, or E belts, 1 to 300 horsepower. Stationary or Motion Control. Delivery good. *Call your nearest District Office or Texrope dealer.*



***VARI-PITCH* SPEED CHANGERS**
Speed range to 375%. 1½ to 75 horsepower. Single handwheel controls speed. Delivery good. *Call your nearest District Office or Texrope dealer.*

Best Delivery in the Industry!

NOW *YOU CAN GET* nearly every standard V-belt drive component from Texrope stocks. Even on non-stock items, Texrope delivery is the best in the industry. And Texrope is the *only* brand that meets *every* V-belt need.

Selecting a drive is as easy as looking up a telephone number in the 144 page Texrope Pre-Engineered Drive book. Covers 90% of all V-belt drives. Write today for Bulletin 20 B 6956 or see your nearest Allis-Chalmers Authorized Dealer or District Office. Also listed in Sweet's.

ALLIS-CHALMERS, 1059A SO. 70 ST. A 2546
MILWAUKEE, WIS.

Texrope, Super-7, Vari-Pitch, Magic-Grip, Tex-Iron, Tex-steel and Texdrive are Allis-Chalmers Trademarks.

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

ALLIS-CHALMERS

Originators of the Multiple V-belt Drive for Industry

Are you taking advantage of our Free Engineering Service?

Our Wire Rope Experts will help you select the right rope — *save you trouble and money!*

● If you use wire rope, our free on-the-job engineering service will show you how to get the most out of it. We will send an engineer to help you select the rope best suited to your needs . . . and to help you solve any wire rope problems that might arise.

This free engineering service is but one of the many reasons why the BIG Demand is for TIGER BRAND!

Made to close tolerances and unvarying quality standards by the world's largest manufacturer of wire rope, U·S·S American TIGER BRAND Excellay Preformed Wire Rope is as fine as any rope money can buy. Possessing strength, toughness, and flexibility in the right combination, it will stand up tirelessly under long, hard service . . . to help you do a more efficient job all the way through.

Immediate Delivery!

Your supplier can now furnish any amount of TIGER BRAND Wire Rope in either non-preformed or our famous Excellay Preformed.

AMERICAN STEEL & WIRE COMPANY
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN TIGER BRAND WIRE ROPE

UNITED STATES STEEL

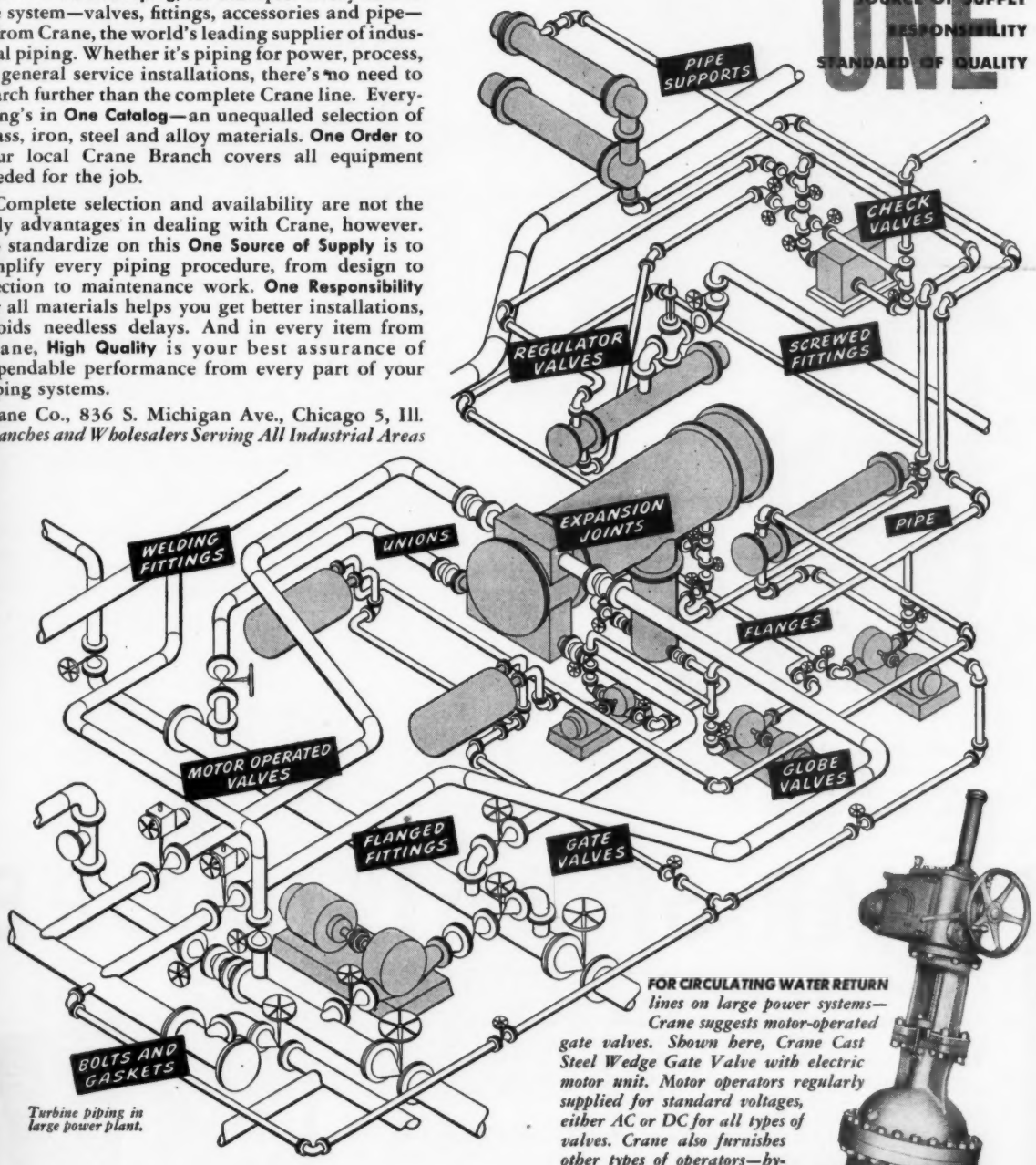
Everything in power piping ...on One Order to Crane

Take This Turbine Piping, for example. Every item in the system—valves, fittings, accessories and pipe—is from Crane, the world's leading supplier of industrial piping. Whether it's piping for power, process, or general service installations, there's no need to search further than the complete Crane line. Everything's in **One Catalog**—an unequalled selection of brass, iron, steel and alloy materials. **One Order** to your local Crane Branch covers all equipment needed for the job.

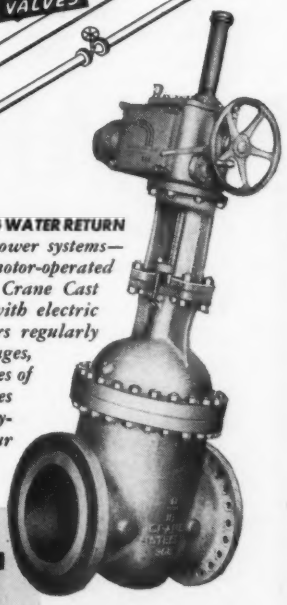
Complete selection and availability are not the only advantages in dealing with Crane, however. To standardize on this **One Source of Supply** is to simplify every piping procedure, from design to erection to maintenance work. **One Responsibility** for all materials helps you get better installations, avoids needless delays. And in every item from Crane, **High Quality** is your best assurance of dependable performance from every part of your piping systems.

Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY



Turbine piping in large power plant.



FOR CIRCULATING WATER RETURN *lines on large power systems—Crane suggests motor-operated gate valves. Shown here, Crane Cast Steel Wedge Gate Valve with electric motor unit. Motor operators regularly supplied for standard voltages, either AC or DC for all types of valves. Crane also furnishes other types of operators—hydraulic, air, etc. See your Crane Catalog.*

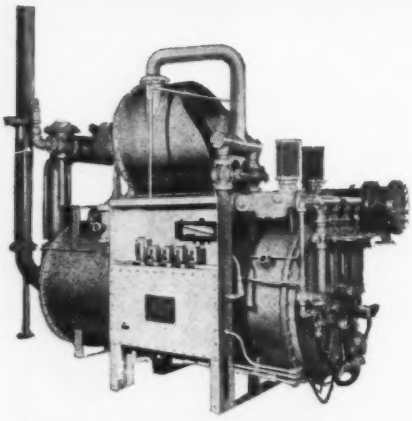
EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

INERT GAS . . . automatically produced . . . at 8¢ to 15¢ per mcf! . . .



Kemp Model 20 MIHE Inert Gas producer. 20,000 cfh discharged at 10" W.C. Completely wired and ready for immediate connection to utilities.

How does that compare with what you are now paying for inert gas?

The difference tells you how long it will take to pay for a Kemp Inert Gas producer out of savings.

And indeed, there will be savings!

Not only in cost of gas, but in freedom from wrestling with CO_2 bottles . . . in the opportunity to use inerts as generously as you wish . . . in the ability to pipe it throughout the plant for use in blanketing, agitation, fire-protection . . . in the ability to turn it on and off at need with production cost per Mcf uniform at high or low demand.

Send for a Kemp engineer . . . there's one near you who knows your problems and how Kemp can help save money for you.

KEMP of BALTIMORE

PRECISION CARBURETORS. BURNERS FOR INDUSTRIAL HEAT CONTROL. FIRE-CHECKS AND OTHER SAFETY DEVICES.
ATMOSPHERE GENERATORS. INERT GAS PRODUCERS. ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL.

The C. M. Kemp Manufacturing Co.
405 East Oliver Street
Baltimore 2, Maryland

Please send me your NEW Bulletin I-10 on Inert Gas Generation ☐
Please send a Kemp representative in to see me ☐

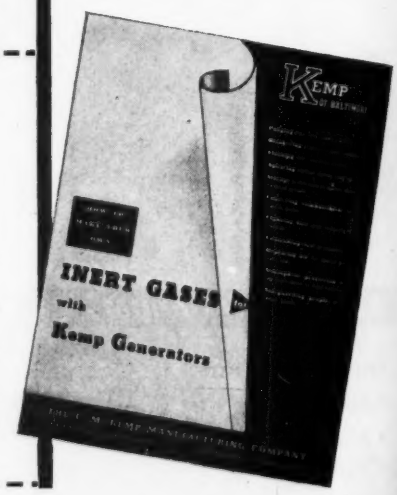
Name .....

Company .....

Street .....

City ..... Zone .....

State BOGJ-11



You Fit Your Gun to Your Target

BUY V-BELTS THE SAME WAY

YOU'D be taking a risk trying to bag an elephant with a bird gun. Potting clay pigeons with a .22 doesn't make sense. And it's just as hopeless to expect the same type of V-belt to handle all the many variations of V-drive operating conditions.

That's why Goodyear offers the most complete line of V-belts—*a special construction to meet every drive requirement.*

To meet belt stretch and maintenance problems, there's a Goodyear exclusive—COMPASS-V-STEEL belts muscled with wiry steel cables. *High overloads and shock stresses?* Pick a Goodyear belt bodied with multiple high-tensile, resilient cords. *Fast drives, with small pulleys and short centers* call for a belt with high-flex-life—gained by Goodyear's single-plane endless-cord load carriers. *Belts hard to apply?* Choose Goodyear's open-end belting with special fabric body of high fastener strength.

Drive-Fitted by the G.T.M.

Whichever of these time-proved constructions fits your drive best, you can get it in a Goodyear V-belt—also built with oil-resistant, heat-resistant or non-static features when desired. The G.T.M.—Goodyear Technical Man—will gladly recommend the best Goodyear V-belt to give you longer trouble-free service at lowest ultimate cost. Write: Goodyear, V-Belt Sales Dept., Akron 16, Ohio.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GTM-Specified COMPASS-V-STEEL BELT
A Load-carrying section of endless high-tensile steel cable.
B Vents open between pulleys, dissipating heat.
C Vents compress rounding pulleys, giving continuous gripping surface.
D Highest quality rubber underbody.
E Sturdy, bias-laid fabric cover resists wear.
Made in all standard cross sections.
Stretch practically zero means less maintenance
GTM
1898
50
GOODYEAR ANNIVERSARY
1948

FOR BELTS, HOSE, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

Compass—T. M. The Goodyear Tire & Rubber Company

GOODYEAR

V-BELTS

Biggest Built... Better Built for Toughest OIL FIELD HAULING

● Here's the largest truck ever built in standard production for oil field service. It's a Mack Model LRSW — 115,000 lbs. gross vehicle weight — powered by a 275 h.p. diesel engine.

Gulf Oil Corporation recently ordered four of these mighty Macks for off-highway operation in the oilfields of Venezuela. Others are being delivered to Asiatic Petroleum Co. and Atlantic Refining Co. for service in the same area. All of these trucks will join numerous other Macks now working in these fields.

In size and stamina, these huge Macks are striking examples of the way Mack designs and builds trucks to meet the specific job demands of punishing oil field work.

For every phase of oil field hauling, there's a Mack truck sized right and built right to do the job as only a Mack can do it — with unmatched economy and enduring reliability. Macks are in there every step of the way . . . hauling scientific exploration equipment, carrying drill rigs, cementing units, draw works, casing, boilers, power units — wherever the job calls for greater capacity, power, strength and flexibility.

IT'S PART OF THE LANGUAGE:

Built like a

Mack

Mack Trucks, Inc. Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

Most Advantageous
. . . Because it costs so little more, there's no longer one valid reason for using any wire rope but
Preformed Wire Rope
Ask your manufacturer or distributor to tell you why Preformed wire rope lasts so long, why it handles so easily, and why it saves you so much time and money.

UNION PACIFIC

The Governor of Nevada *invites You*

STATE OF NEVADA
EXECUTIVE CHAMBER
CARSON CITY

VAIL PITTMAN
GOVERNOR

To American Industry:

With the rapid increase in population of the United States, combined with the decentralization of industry and the westward movement, Nevada is destined for great industrial expansion in the near future.

Contributing factors are:

1. Cheap hydro-electric energy
2. Raw materials, with emphasis on livestock and minerals (metallic and non-metallic)
3. Other natural resources
4. Favorable labor conditions because of friendly relationships between industry, management and labor
5. Ideal climate and exceptionally favorable working conditions
6. Nevada's tax structure:
   - No Inheritance Tax
   - No Income Tax
   - No Sales Tax
   - No Tax on Intangibles
7. Unsurpassed transportation facilities and close proximity to water transportation.

I respectfully suggest that you investigate the opportunities and advantages Nevada offers industry for investment and expansion.

Cordially yours,

Vail Pittman
Governor

Vail Pittman

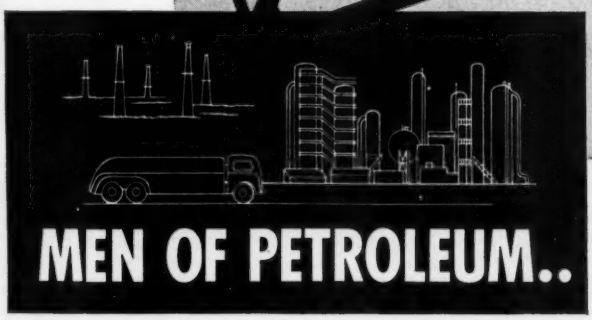
* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Daily Streamliners

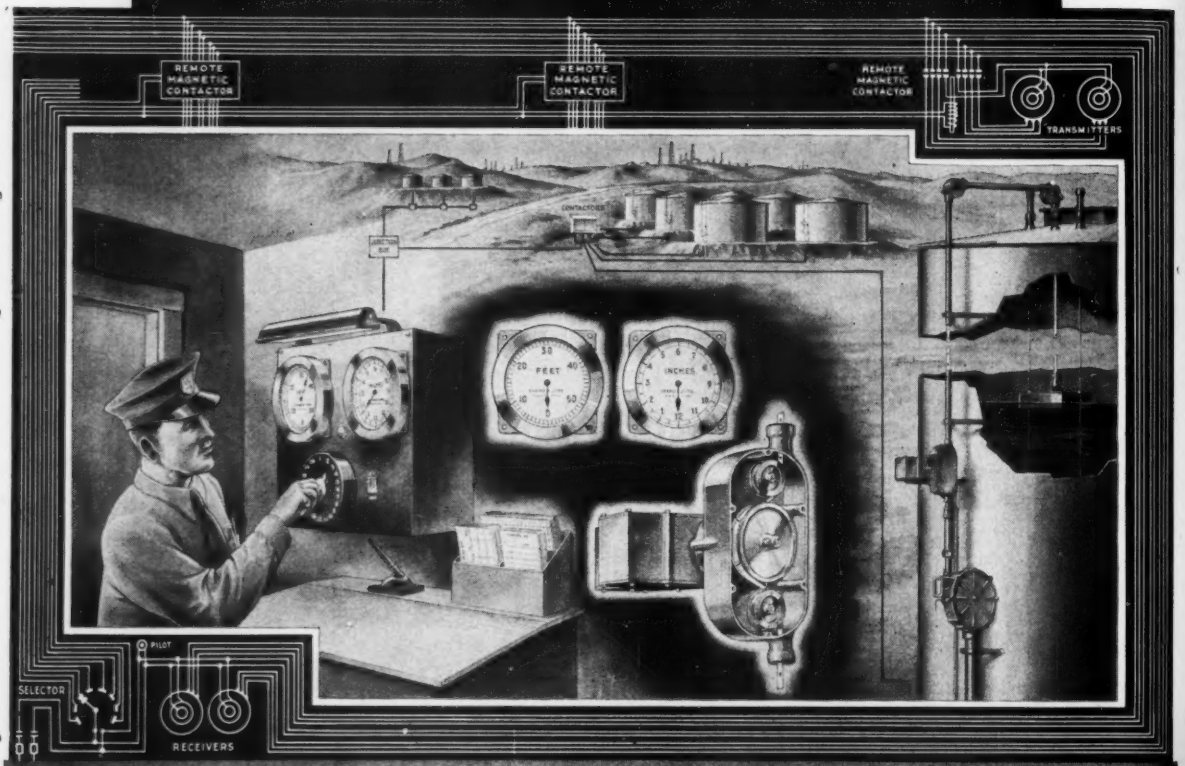


MEN OF PETROLEUM..

RIG BUILDER... He tailors a pile of steel and lumber into the derrick that will support thousands of feet of drill pipe and casing to be lowered down into the earth. Scrambling nimbly over narrow beams high in the air, our rig builders work with wrenches, bolts, and rigging, lacing together the steel tower. When the derrick is up, the rig builders disappear. But they're not through. When the drilling operation is over, they'll come back and dismantle the derrick, move it to another site, start all over again.

STANDARD OIL COMPANY OF CALIFORNIA

REMOTE READING TANK GAUGING



If you are interested in the last word in speed, accuracy and safety in automatic tank gauging, the S. & J. electric system, illustrated above, will appeal to you.

The heart of the system is the Selsyn motor, whose simplicity, accuracy, and practical infallibility has been proven on shipboard, in engine room and navigation control, gun control, and other equipment which must be operated from remote positions.

A transmitting unit is employed at each tank. A receiving unit in the instrument reading room, graduated for liquid level indication, can service an indefinite number of transmitting units.

The system is applicable to S. & J. Automatic Tank Gauges now in service, as well as new installations. Illustrated folder is available on request.

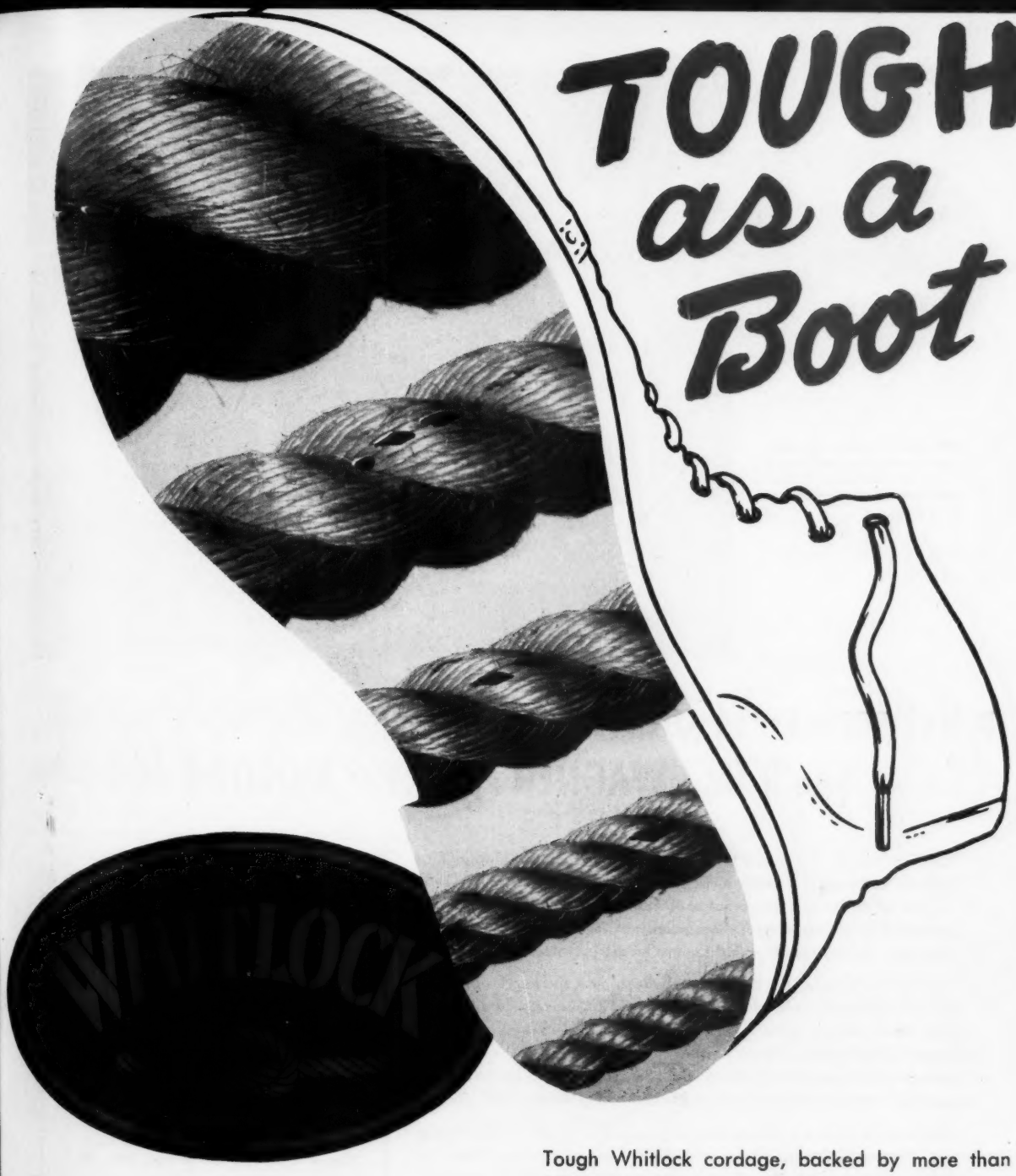
SHAND & JURS CO.

NEW YORK CHICAGO HOUSTON LOS ANGELES SEATTLE

S&J

SHAND & JURS

TOUGH as a Boot



Tough Whitlock cordage, backed by more than 100 years of experience, lasts longer—does any job more safely. Save money on rope. Ask for Whitlock at your near-by Jones & Laughlin Supply store.

Export: 230 Park Ave., New York 17, N. Y., U. S. A.

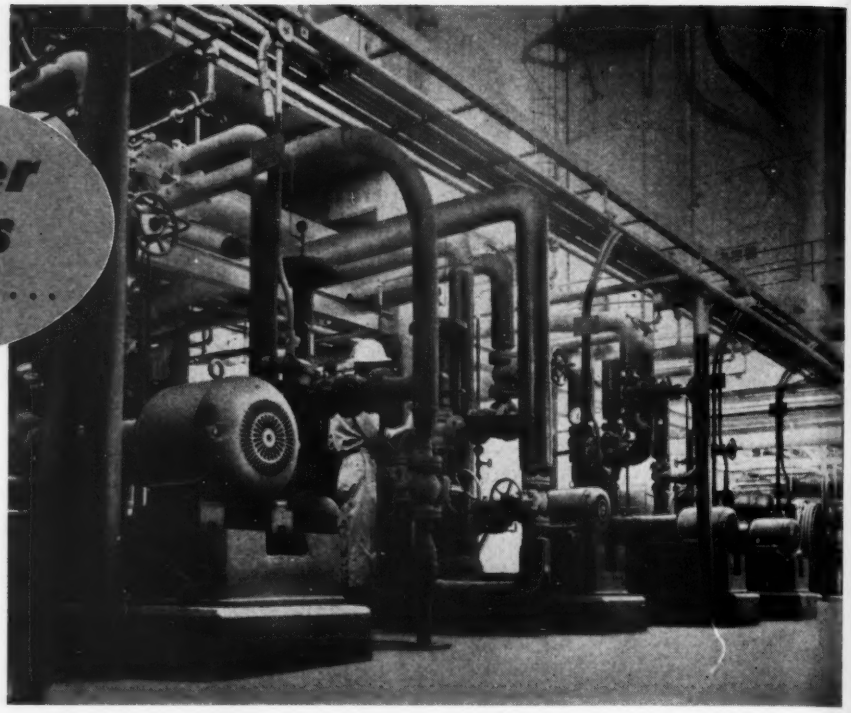
JONES & LAUGHLIN SUPPLY COMPANY

Subsidiary of Jones & Laughlin Steel Corporation

TULSA, OKLAHOMA

J&L STEEL

Wagner Motors on the job . . .



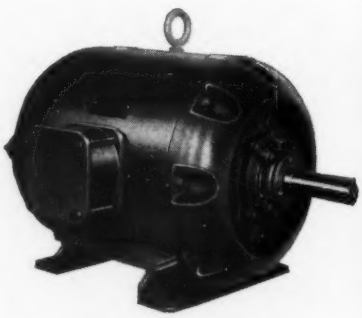
3600-rpm, 3 phase, 440-volt, type HP explosion-proof motors in 5 to 25 horsepower ratings operating pumps at a large refining plant.

In Refineries—in Oil Fields—wherever *Safety Counts...* you'll find WAGNER *type HP* MOTORS

Wagner type HP Explosion Proof Motors are particularly designed to operate economically and safely in surroundings where open-type motors might cause a dangerous explosion. They have been tested and approved by Underwriters' Laboratories for Class I Group D hazardous locations and are ideally suited for use by the petroleum industry.

In addition, Wagner HP motors are built to meet the tough operating conditions found in oil fields and refineries. Rain, snow, and dust can't hurt these motors because they have "built-in" protection against destructive elements. If the atmosphere in your plant contains explosive gases, fumes, vapors, or combustible substances, it will pay you to investigate the safety advantages and long life qualities of Wagner HP Motors.

Twenty-nine branch offices, located in principal cities, are ready to assist you, without obligation, whenever you have a motor problem. Write for Bulletin MU-185 for information on the complete line of Wagner Motors.

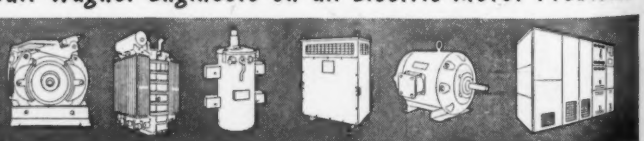


Wagner type HP Explosion-Proof Motor for hazardous-location motor drives.

Wagner Electric Corporation
6389 PLYMOUTH AVE., ST. LOUIS 14, MO.

Consult Wagner Engineers on all Electric Motor Problems

Wagner Electric Corporation EST. WE 1891



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

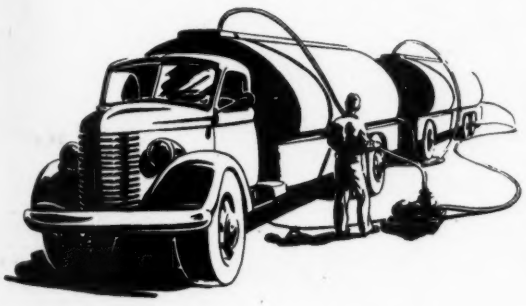
ELECTRICAL AND AUTOMOTIVE PRODUCTS

MAR 18

OAKITE
Specialized Cleaning

Oakite solves another tough cleaning job

look at this record:



PROBLEM: A Midwest company had to clean the interior of a 3000 gallon insulated asphalt trailer before making welding repairs. About 2 inches of asphalt had to be removed from the bottom of the truck, heating pipes and walls of the trailer.

SOLUTION: The Oakite Man was called in. He dumped in 800 gallons of hot water. Added recommended amount of Oakite Composition No. 19, and mixed into solution. Pump-circulated Oakite cleaning solution from top manhole back through bottom of trailer using flexible steel pipe. Circulated solution 7 hours; drained and then steamed out interiors to remove loosened asphalt.

RESULT: Oakite Composition No. 19 retained potent cleaning strength through entire procedure and easily cut through tenacious deposits. Removed all asphalt without damage to surfaces. Left clean surfaces to facilitate inspection and repair.

Your Cleaning Job Here?

(check it, clip and send to Oakite Products, Inc.)

- ☐ cleaning tank car interiors
- ☐ paintstripping equipment
- ☐ descaling water coolers
- ☐ steam cleaning equipment
- ☐ cleaning fractionating towers
- ☐ descaling debutanizer condensers
- ☐ cleaning heat exchangers
- ☐ cleaning transformer coils
- ☐ cleaning evaporative condensers

look at these savings:

Former method took two men three to four days of hand chipping at a cost near $128. Specialized Oakite Composition No. 19 and Oakite Method cut that cost about half. And the job was completed in 10 hours.

Chances are Oakite cleaners and methods can solve your cleaning jobs, too. Contact your nearby Oakite Technical Service Representative next time a cleaning problem comes up. Or if you're stumped by one of the jobs at left, check it, clip and send to,

OAKITE PRODUCTS, INC., 44C Thames St., NEW YORK 6, N. Y.
Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE

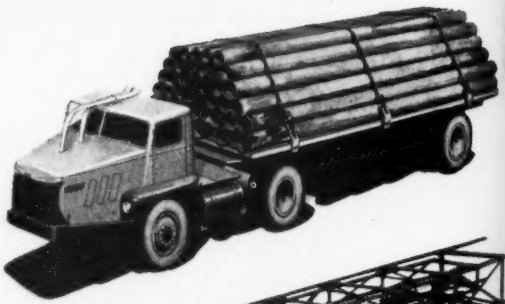
Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

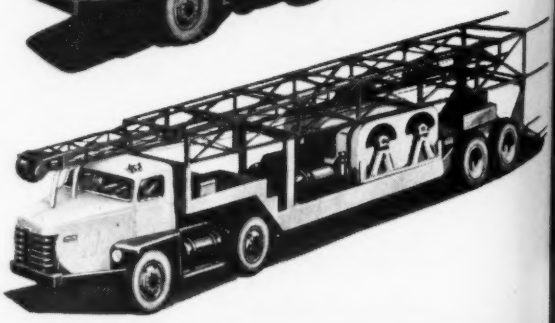
NO "FAIR-WEATHER" FRIEND!

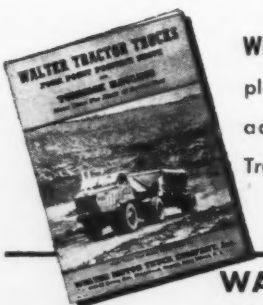
WALTER TRACTOR TRUCKS haul huge loads in ANY weather and running conditions

WINTER, spring, summer and fall—you can go right on hauling huge rigs and heavy equipment with Walter Tractor Trucks. Regardless of soft ground, mud, snow, slippery surfaces and grades . . . the unfailing four-wheel traction of Walter Tractor Trucks continues to pull.

This is possible only with Walter Tractor Trucks because of the exclusive 4-Point Positive Drive, with three patented automatic locking differentials. Power is constantly and automatically concentrated on the wheels having the most traction at any instant. Steady tractive effort is available under all conditions.







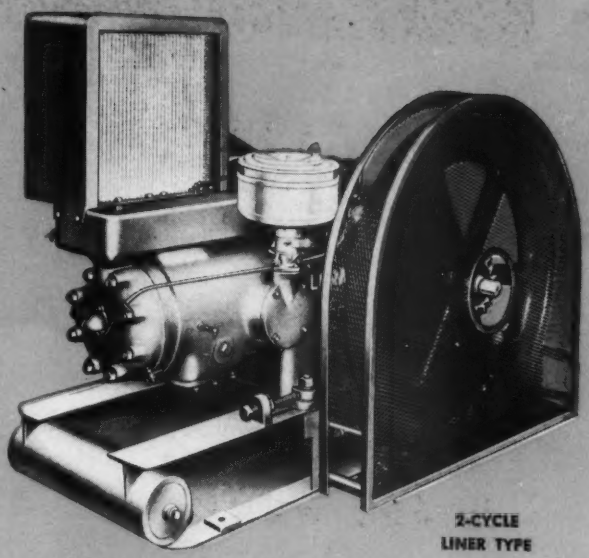
WRITE for detailed literature explaining this feature and other advantages of Walter Tractor Trucks for oilfield hauling.

WALTER MOTOR TRUCK COMPANY
1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

WALTER TRACTOR TRUCKS

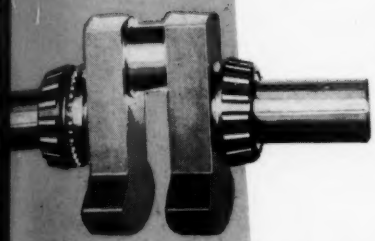
Types "L" and "O" "Oilwell"-Lorain Engines

..are adaptable to a wide range of oil-field applications

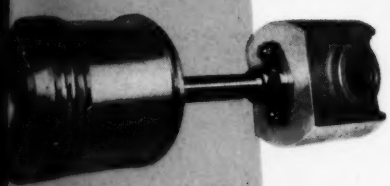


2-CYCLE LINER TYPE

Outstanding Features

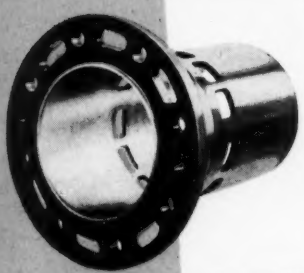


FORGED-STEEL CRANKSHAFT is mounted in heavy-duty tapered-roller bearings. Crankshaft is counterweighted to reduce torsional stress and bearing pressures. The large diameter crankshaft is machined to carry the pilot bearing for the clutch power take-off.



PISTON—Precision-ground piston is fitted with five rings assuring high compression, easy starting, and maximum power for continuous service. The flanged piston rod is bolted to both the crosshead and piston, thus permitting easy removal of piston for maintenance and service in the field.

CONNECTING ROD of the automotive type is drop-forged from alloy steel and heat-treated. It has a reinforced I-beam section with solid eye for crosshead pin and bushing. Connecting-rod cap is held in place by heat-treated, body-fitted bolts. The crank pin bearing is a replaceable, shim-adjusted bronze backed babbit lined shell.



CYLINDER LINER is a wet-sleeve type and is made from alloy cast-iron to assure long life. It is quickly and easily replaced on location; eliminating costly reboring jobs, minimizing down-time, and maintaining standard dimensions.

THE "OILWELL"-Lorain Type "L" and Type "O" Engines are heavy-duty, single cylinder, two-cycle power units, built to withstand continuous service with minimum attention.

They have (1) condenser-type cooling system, (2) large capacity oil reservoir, (3) oil-bath splash lubrication for crankshaft and bearings with mechanical force-feed lubricator supplying positive lubrication to the liner and piston—all contributing to effective lubrication.

These engines are sturdy, compact and weatherproof, and can be equipped to operate on either natural gas or butane—and are convertible to cold-start Diesel engines.

BRIEF SPECIFICATIONS

"Oilwell"-Lorain Engine	Type "L"	Type "O"
Bore and Stroke ..... inches	7½ x 8	9½ x 10
R. P. M.	600	450
Horsepower	21.4	32
Mean Effective Pressure.....p.s.i.	40	40
Same Ratings for Gas or Diesel Fuel		

Contact your nearest "Oilwell" representative and ask for "Oilwell" Engine Booklet Number 9C-1047.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

Executive Office—DALLAS, TEXAS
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NEW YORK 20, N. Y.

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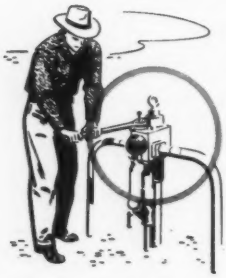
COLUMBUS, OHIO . . . DALLAS, TEXAS
HOUSTON, TEXAS . . . TULSA, OKLAHOMA
LOS ANGELES, CALIFORNIA

USS "OILWELL"

UNITED STATES STEEL

IS YOUR *Pulling Unit* HANDY?



When it is necessary to pull your well, do you have to wait days for service equipment to reach you? Have you figured how much oil you lose just waiting for a pulling rig?

If you have, you'll appreciate the advantages enjoyed by the *Free Pump* operator. His *pulling unit* is always handy. It's right at the wellhead. A turn of the 4-Way Valve handle is all that is needed to surface the bottom hole pump from any depth. It is seated the same easy way.

With *Free Pumping*, there's no waiting for equipment. No pulling expense. No rigging up or tearing down time. Your well is off production only the short time it takes to circulate the *Free Pump* in and out of the well.

Your lease is made independent of uncontrollable factors ...the weather...condition of the roads...availability of equipment.

Eliminate the delays...the waiting...the lost production ...the unnecessary down-time. Keep your *pulling unit* handy by changing to *Free Pumping*. Your local Kobe representative has some interesting figures on the saving you can make when you switch to *Free Pumping*. Call him tomorrow.

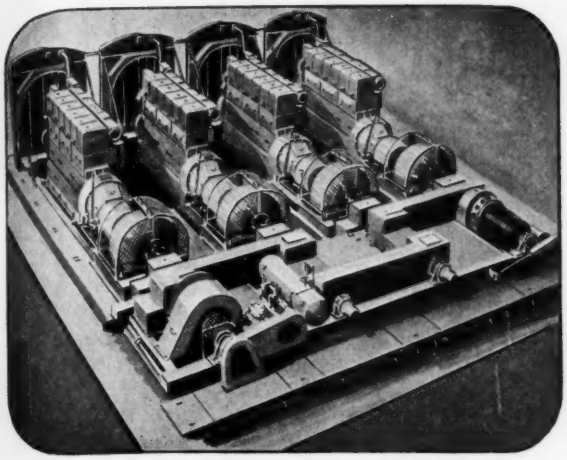
Free Pump

KOBE

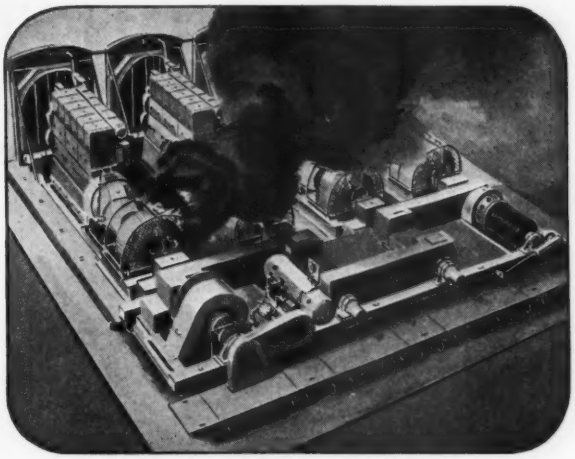
ONE OF THE DRESSER INDUSTRIES

KOBE Inc. *General Offices:* Huntington Park, Calif. • *Division and District Offices:* Avenal, Bakersfield and Ventura, Calif.; Vernal, Utah; Oklahoma City and Tulsa, Okla.; Brownfield, Corpus Christi, Dallas, Houston, Longview, Odessa and Wichita Falls, Texas; Natchez, Miss.; Hobbs, N. M.; Great Bend, Kan.; New York.

THESE ARE THE DAYS OF FREE PUMPING

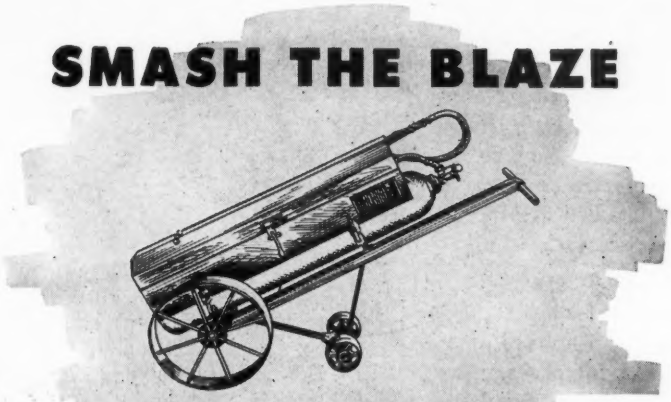


If a Diesel rig—



bursts into flames—

SMASH THE BLAZE



THE *Kidde* WAY!

A fire starting near a Diesel drilling can easily spread—may damage costly equipment beyond repair—unless you stop the blaze in time!

So play safe—protect your Diesel rigs with *Kidde** carbon dioxide (CO_2) extinguishers. CO_2 can quickly smother the dangerous fires that start in fuel oils, lubricants or other flammable liquids. And it cannot cause corrosion of metal parts, nor damage equipment in other ways.

Easy-to-handle *Kidde* wheeled units provide CO_2 capacities of 50, 75 and 100 pounds. They pack the kind of wallop you want for fighting really tough fires! For less serious hazards, investigate *Kidde* Hand Portables, with capacities up to 25 pounds.

Ask a Kidde representative for full details.

*Also known as "LUX"

The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Kidde

Walter Kidde & Company, Inc. • **1154 Main St., Belleville 9, N. J.**

CONVERT DUST INTO DOLLARS

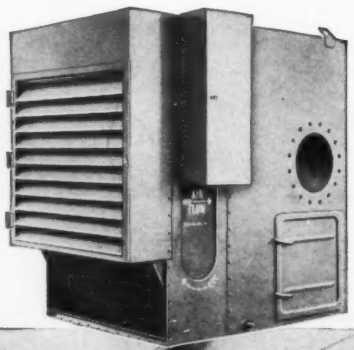
AAF Multi-Duty Air Filters return dollar savings by eliminating dust damage

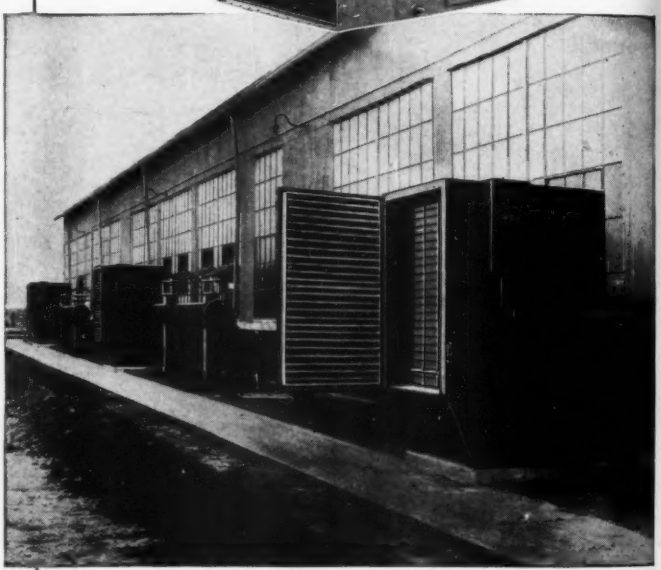
THE more than 3000 Multi-Duty Self-Cleaning Air Filters now in service give proof to the fact that the cost of clean air is incidental to the savings.

The Multi-Duty Type CMS is an automatic, self-cleaning air filter built to withstand the severe conditions of engine and compressor service. It features the AAF overlapping panel curtain which makes possible both the delivery of a uniform volume of clean air and a positive, trouble-free, self-cleaning operation. The Multi-Duty is truly automatic. Its operating resistance remains fixed when once established for a given dust concentration and requires no attention other than periodic inspection and the removal of sludge at regular intervals.

Multi-Duty filters for outdoor installation are usually supplied as a housed unit consisting of front louvers for protection of the filter curtain and a plenum chamber to which engine or compressor intake is connected. A perforated metal baffle in plenum chamber dampens intake pulsations and distributes air flow uniformly over the entire curtain area of the filter.

If you want to convert dust damage into tangible dollar savings, write today for complete information on the AAF Multi-Duty Self-Cleaning Air Filter.

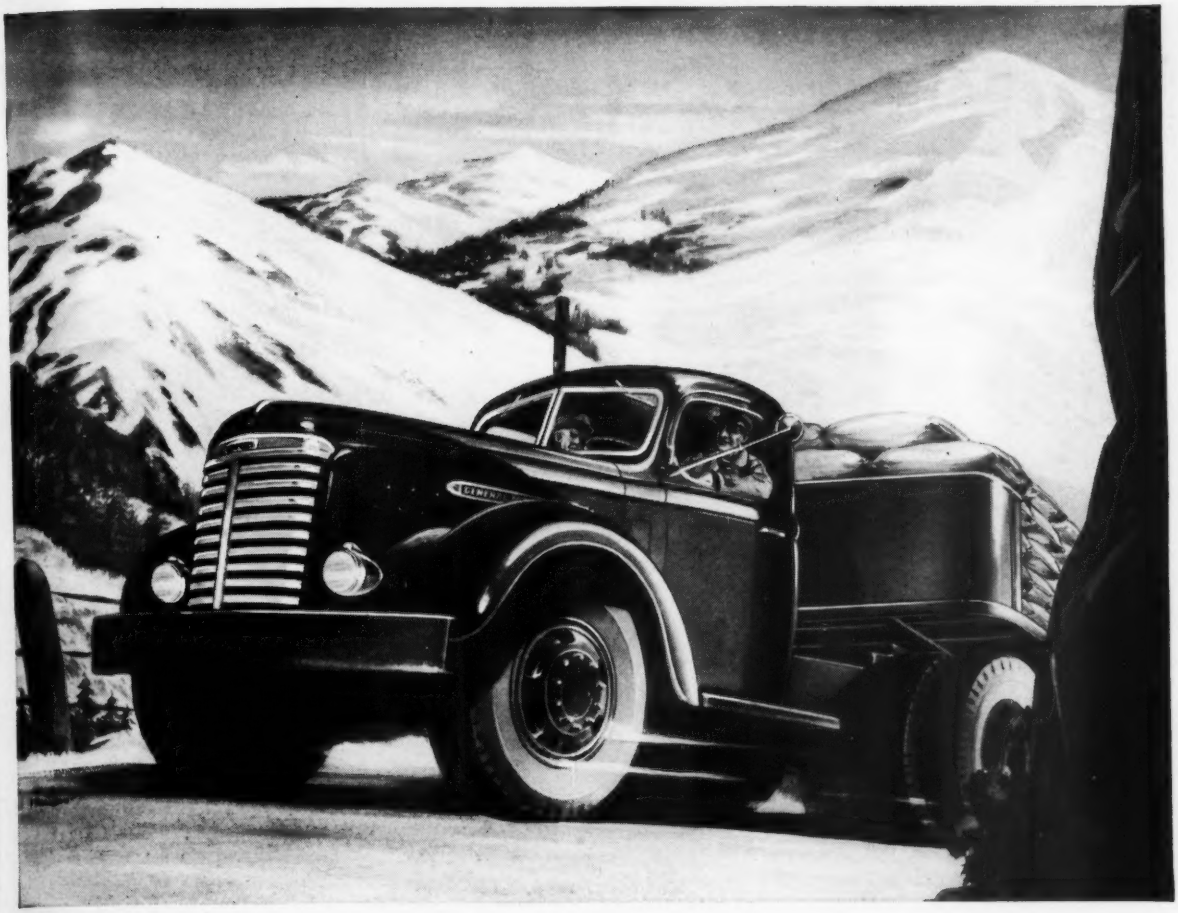




AMERICAN AIR FILTER COMPANY, INC.
444 Central Ave., Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

FREE FOR THE ASKING!
New Bulletin No. 150 contains complete data on Multi-Duty filters for engine and compressor service.

AAF
AIR FILTERS
AND DUST CONTROL EQUIPMENT



THE *Harder* THE HAUL
THE *Better* THEY LIKE IT

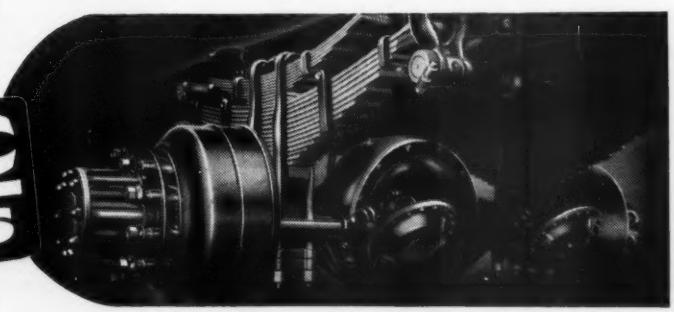
Pulling heavy loads over the passes of the Continental Divide, where elevations often exceed 11,000 feet, is all in a day's work for heavy duty GMCs like the giant Diesel pictured above.

GMC heavy duties have big, dependable valve-in-head gasoline engines in four sizes . . . powerful pulling GM Diesels in 4-cylinder and 6-cylinder types. They have thick-beamed, heavy-geared axles. And they have frames, clutches, transmissions and brakes that combine with these engines and axles to provide trucks for every type of transport job . . . over-the-road or off-the-highway . . . in weight ratings up to 90,000 pounds.

From every heavy hauling angle . . . economy, dependability and long life . . . your best truck buy is a big, heavy duty GMC.

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

GMC heavy duty trucks are all-truck designed and all-truck engineered in every part and feature. This rear axle, spring and brake assembly, used on a 750 series Diesel, is typical of the all-over rugged construction that enables GMCs to haul big pay-loads for long periods at low cost.



THE TRUCK OF VALUE

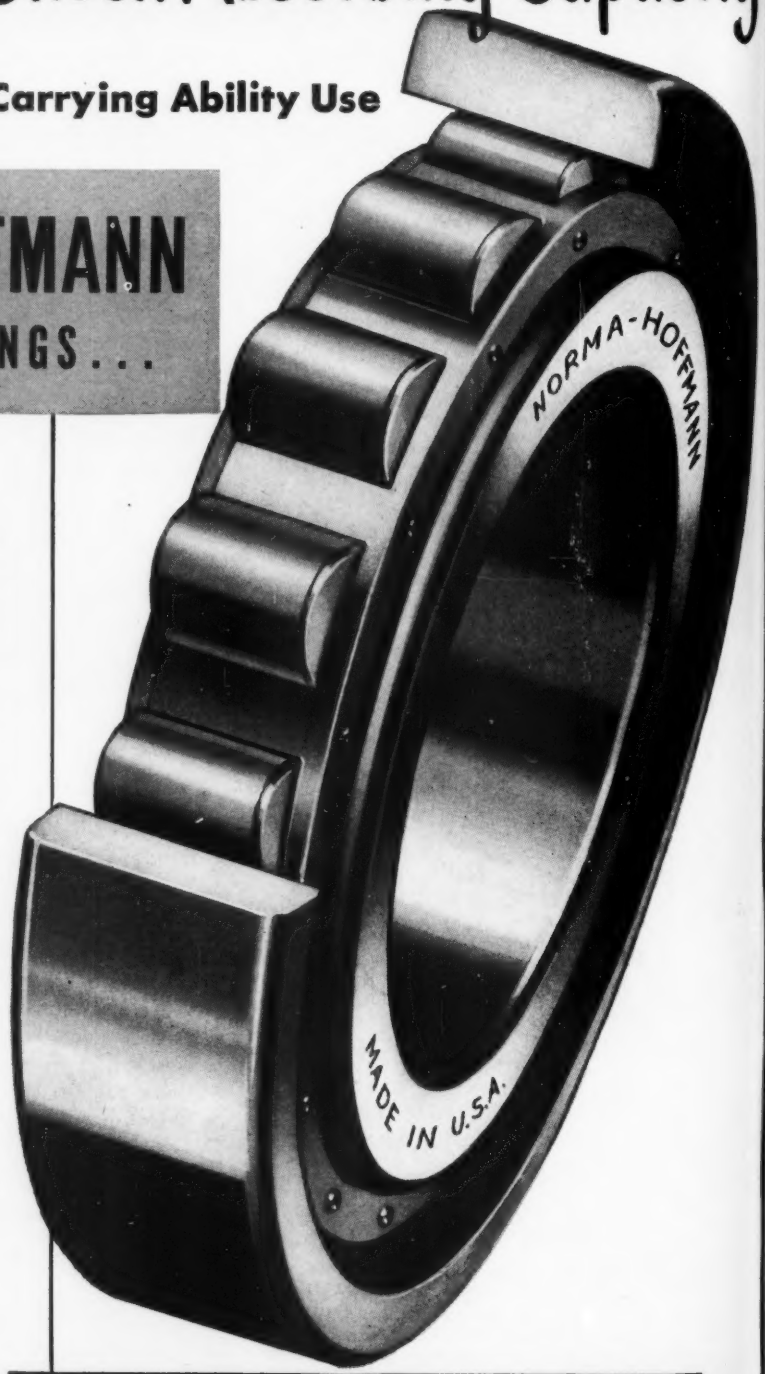
GMC TRUCKS

GASOLINE • DIESEL

For Highest Shock Absorbing Capacity

and Greatest Load Carrying Ability Use

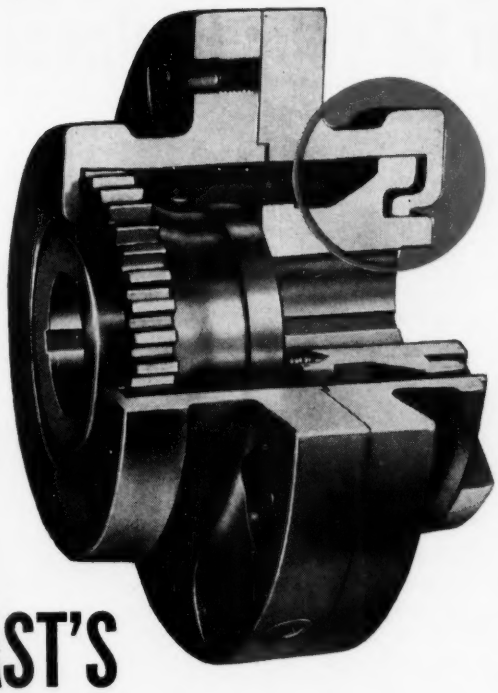
NORMA-HOFFMANN
ROLLER BEARINGS . . .



- Performance records in all types of equipment prove that Norma-Hoffmann Precision Roller Bearings have the built-in stamina to stand up under the severest of operating conditions.
- Their short, accurate roller and cylindrical race construction provides maximum load contact area . . . gives these bearings high steady load capacity, large overload capacity, and high resistance to shock and vibration.
- Also available in double and single lipped outer ring types. All are interchangeable with standard single row ball bearings.
- Whether your bearing requirements are for original equipment or replacement, these precision-built Norma-Hoffmann Roller Bearings will give you outstanding performance under the most critical severe conditions of speed, load, shock, and vibration.
- Write for information and engineering assistance.

NORMA-HOFFMANN
***Precision* BEARINGS**
BALL • ROLLER • THRUST

NORMA-HOFFMANN BEARINGS CORPORATION,
STAMFORD, CONNECTICUT
FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Dallas, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Seattle, Phoenix.

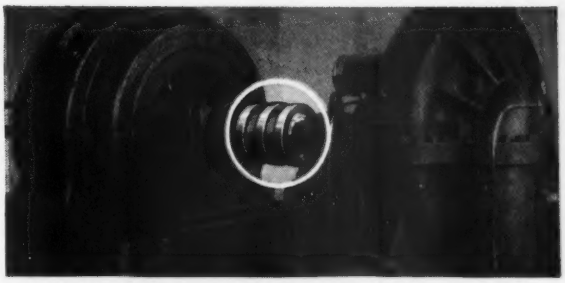


FAST'S

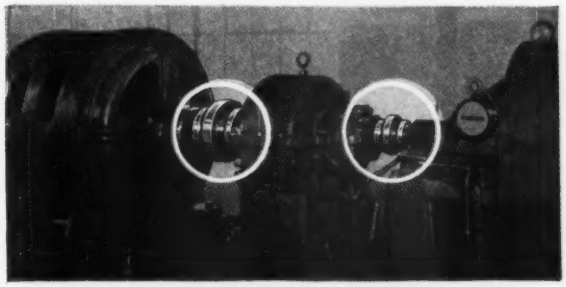
ALL-STEEL Construction Gives NON-STOP Power Transmission!

These installations have an important feature in common. They're all protected against coupling shutdowns by Fast's self-aligning Couplings. That's because these original gear-type couplings are all-steel throughout, *without perishable parts!* Even the load-carrying oil is protected by an *exclusive* "rocking bearing." This bearing is *exclusive* in providing a positive metal-to-metal seal which keeps out moisture, dust and grit. The bearing is also *exclusive* in its correctly engineered position which allows *freedom of movement* to compensate for misalignment because its *spherical* base has *the same axis* as the hub spline faces. No perishable packing rings are used in this vital spot.

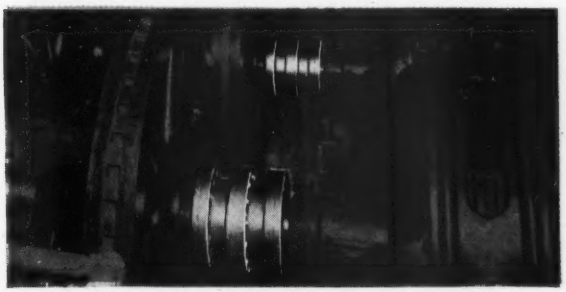
We have a complete line of couplings for immediate delivery. No matter which type of Fast's Couplings you buy, you get the benefits of years of top engineering experience, Koppers' high standards of workmanship and unexcelled coupling service which assure you of spare parts no matter how old your couplings may be. That means non-stop power transmission, longer machine life, lower costs, minimum shutdown losses! Koppers Co., Inc., Fast's Coupling Dept., 321 Scott St., Baltimore 3, Maryland.



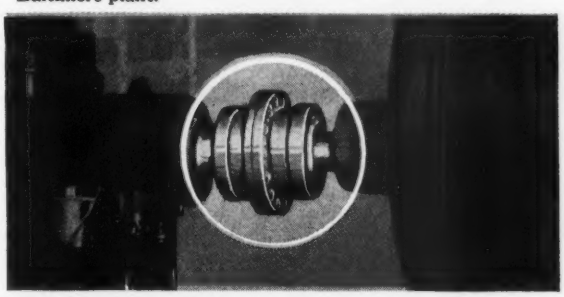
Fast's Coupling connects 1,800 h.p., 600 r.p.m. motor to 30 million-gallon-per-hour pump at City of Montreal pumping station.



These No. 3 and No. 5 Fast's Couplings connect a turbine-reduction gear-generator hookup, 1125 h.p. at 3740/1200 r.p.m., at Firestone Steel Products Co., Akron, Ohio.



This group of Fast's Couplings has been giving trouble-free service since 1922 at the Western Maryland Dairy Company's Baltimore plant.



This No. 4 Fast's Coupling connects a motor and induced draft fan at the West Penn Power Company's Beach Bottom, W. Va., plant.

KOPPERS

FAST'S *self-aligning* COUPLINGS

SEND FOR FREE CATALOG giving detailed descriptions, engineering drawings, dimension and capacity tables and typical installation photographs for the many types of Fast's Couplings. Fill out this coupon and mail it to: Koppers Co., Inc., Fast's Coupling Dept., 321 Scott St., Baltimore 3, Md.

NAME..... POSITION.....

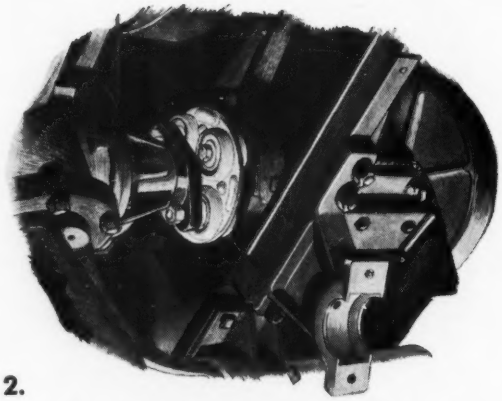
COMPANY.....

STREET..... CITY..... STATE.....

Want to reap a harvest in your business?

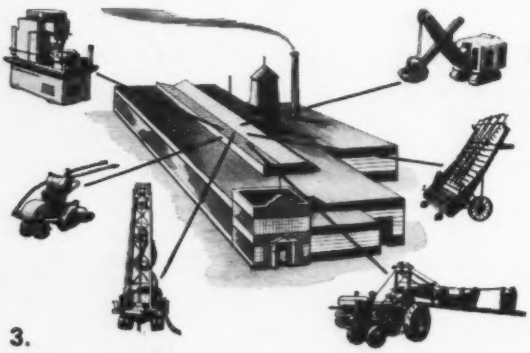
1.

Wanted: a one-man crew to harvest grain in labor-short areas. Cockshutt Plow Co., Ltd., Brantford, Ont., built such a harvesting combine. But trouble-free operation had to be assured on such vital turning parts as the shaft between transmission and differential. Needed: a flexible coupling to absorb shock and vibration, increase shaft life, yet withstand grit, chaff and moisture. Impossible?...



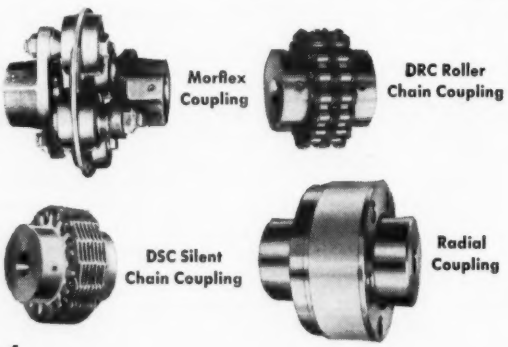
2.

Cockshutt Plow's unusual coupling need was quickly filled by Morse Morflex Couplings. Shockproof, quiet, compact—they take all the kicks the combine gives, *and compensate for misalignment.* Other Morse Couplings—Silent and Roller Chain, 'Junior' and Double Morflex, Radial and Marine Morflex—are made to thresh out particular problems in *your* business. Just . . .



3.

Look how Morse couplings have been applied to such diversified uses as machine tools, material handling lifts, oil wells, power shovels and conveyors. In your plant or on your consumer product, *Morse couplings speed production, eliminate bearing wear, protect equipment and workers.* For that extra attractive addition that makes your consumer products sell, investigate Morse Couplings, right now. Perhaps . . .



4.

You'll get plenty of bright ideas for coupling uses from a set of Morse coupling catalogs. Address: Dept. 246, Morse Chain Co., 7601 Central Ave., Detroit 8, Mich. Or, for on-the-spot engineering advice and aid, write or wire—trained and experienced Morse Sales Engineers will call on you. Ask to see and hear more about the entire line of Morse Mechanical Power Transmission products.

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An antimonial admiralty with an antimonial content of less than .007% — the minimum set forth in Chase Patent No. 2,061,921—cannot be relied upon to guard against dezincification.

•

It has been shown that while tubes with .007% antimony have been satisfactory under mild exposure conditions, a minimum of about .015% is indicated over a wide range of applications.

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Chase Antimonial Admiralty Heat Exchanger Tubes contain nominally .035% antimony to allow for commercial variation sometimes encountered . . . and thus assure you this .015% minimum!

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Remember, only Chase can supply you with this patented Antimonial Admiralty because only Chase can make it, and it costs no more than plain Admiralty.

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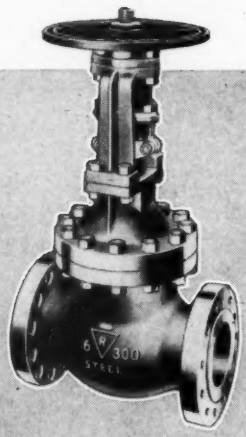
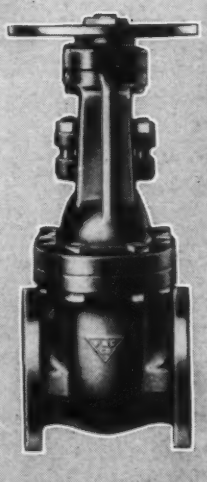
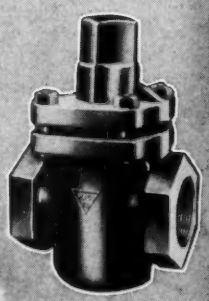
"VALVE MEN" LIKE R-P&C VALVES



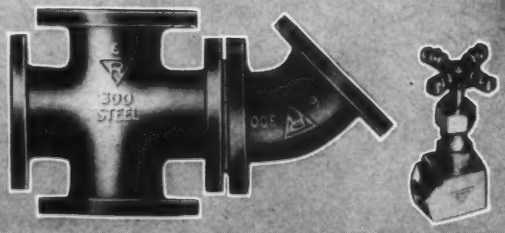
Men who really know valves—
know where to look for those details of design and construction that insure top performance—have a lot of respect for Reading-Pratt & Cady.



***An R-P & C valve** must be more than just an assembly of machined parts. It has work to do. R-P & C feels the responsibility for that work being done faithfully.*



***Consider your R-P & C distributor** as your "valve man"—a responsible source for bronze, iron and steel gate, globe, angle and check valves—Bar Stock valves—iron cocks—Lubrotite gate valves—cast steel fittings.*



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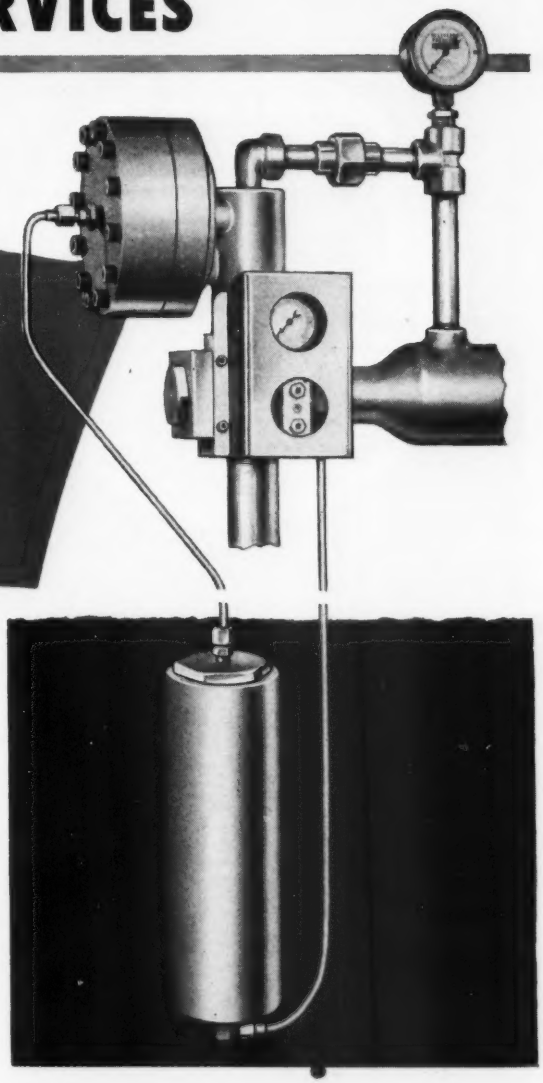

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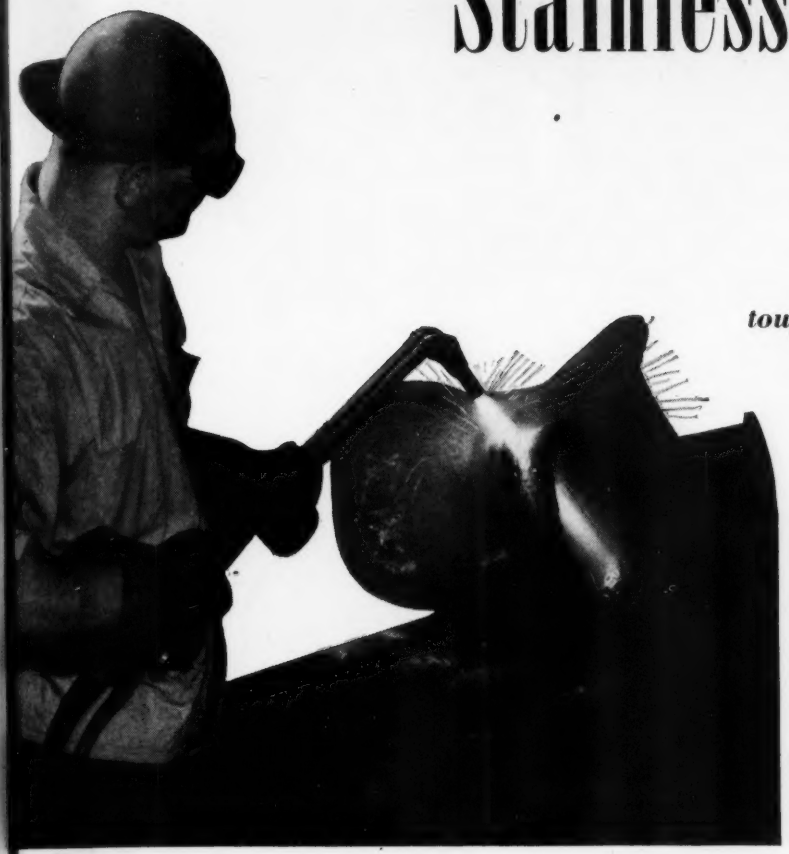
Stainless Steel is TOUGH



tough to cut, too—but LINDE makes the job easier . . . just as easy as cutting carbon steel

LINDE's powder-cutting process overcomes the barrier to fast and economical cutting of stainless or chromium steels.

By means of easily installed attachments for standard oxy-acetylene equipment, powder-cutting can be done without substantial change from carbon steel cutting techniques.

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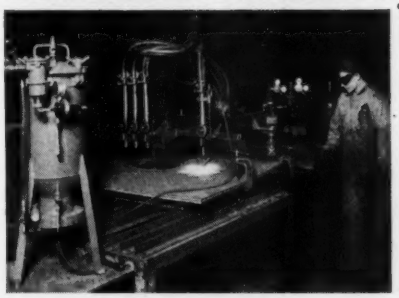
by powder-cutting, risers are removed 20 times faster than by older methods. Removal of riser pads and gouging out defects can be done at considerable savings in cost.

IN STEEL MILLS—

a 12,000-lb. ingot can be powder-scarfed in 4 to 6 hours—about 1/10 the time required for grinding. Sizing of ingots, billets, and slabs, removal of hot tops, scrapping operations, and many other cutting jobs can be done in a fraction of the time previously required.



IN FABRICATING PLANTS—

a stack of twelve 10-ga., type-304 stainless sheets were powder-cut at 8 in. per min. . . . 4-in. I.D. by 8-in. O.D. flanges on ½ in., type 316 plates were made in 2 minutes of cutting time apiece.

If you work with stainless steel you will want to know more about this LINDE process. LINDE can supply the equipment you need, help you to set up, and supply the training help you need.

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3. **BP GEAR STEEL** . . . with hard wearing surface to resist wear, and tough, ductile structure to resist shock loads.
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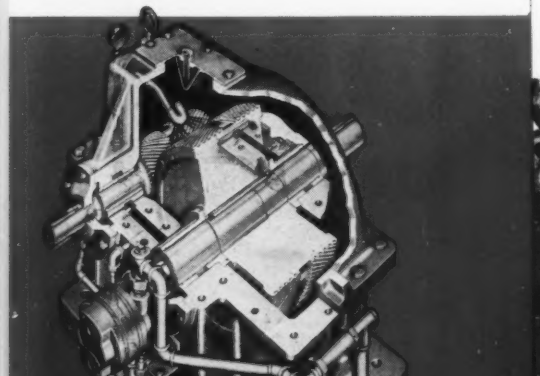
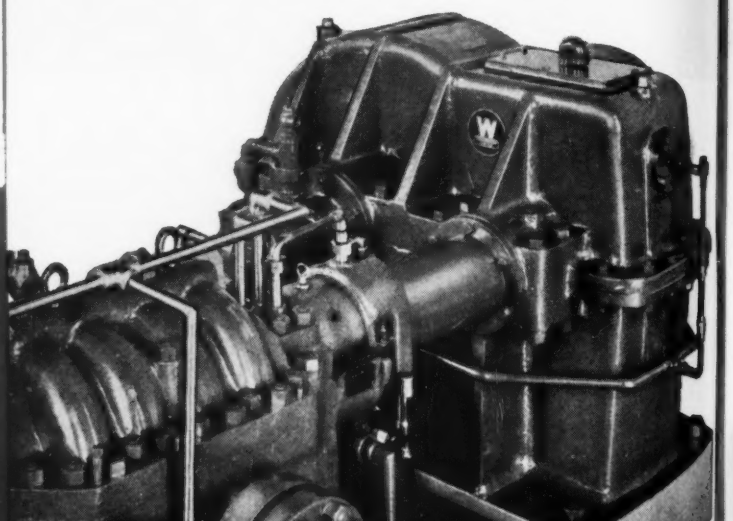
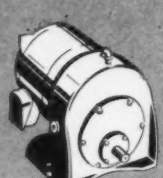
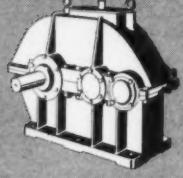


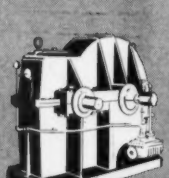


Westinghouse

RPM FITTED DRIVES







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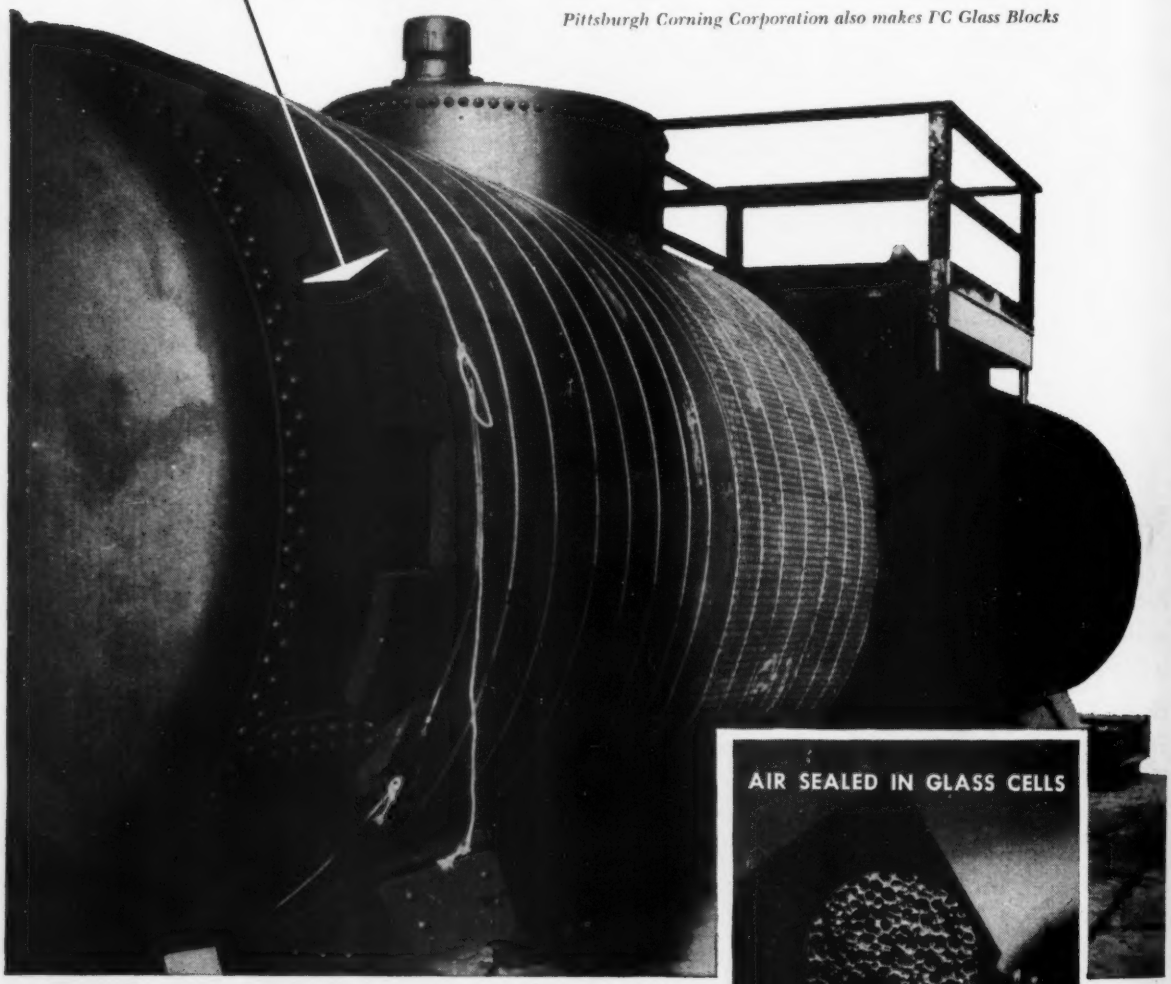
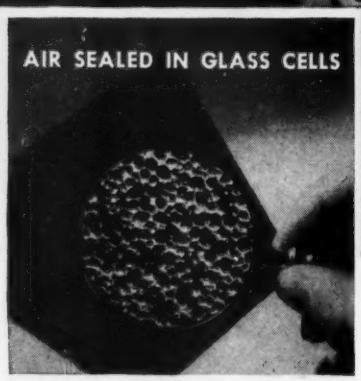
Being glass, Foamglas is fireproof, waterproof. It is unaffected by exposure to humidity, acid atmospheres, wide variations in temperature. It won't check, rot, swell, shift, shake loose or pack down. In fact, elements which so frequently reduce or entirely destroy the insulating efficiency of other insulating materials, are completely powerless to harm PC Foamglas. For tanks, towers, heat exchangers, ducts, breechings, hot and cold piping, and other processing equipment, Foamglas is the insulation that never grows old.

We invite you to send for complete facts about this amazing material. Just write to Pittsburgh Corning Corporation, Room 526-8, 632 Duquesne Way, Pittsburgh 22, Pennsylvania.

Pittsburgh Corning Corporation also makes PC Glass Blocks



PC FOAMGLAS INSULATION is being installed on this 10,000 gallon horizontal tank to help prevent the contents from solidifying in cold weather. Curved segments, lags and standard flat blocks insure a tight fit on tank sides, ends and domes. PC Foamglas insulation is held in place by metal bands and wire mesh, then a coating and paint are applied.



THE MAGNIFIED CROSS SECTION of PC Foamglas shows its cellular structure. It is literally glass bubbles solidified into big, strong, rigid block. In the millions of cells of glass-enclosed air, lies the secret of its insulating value.

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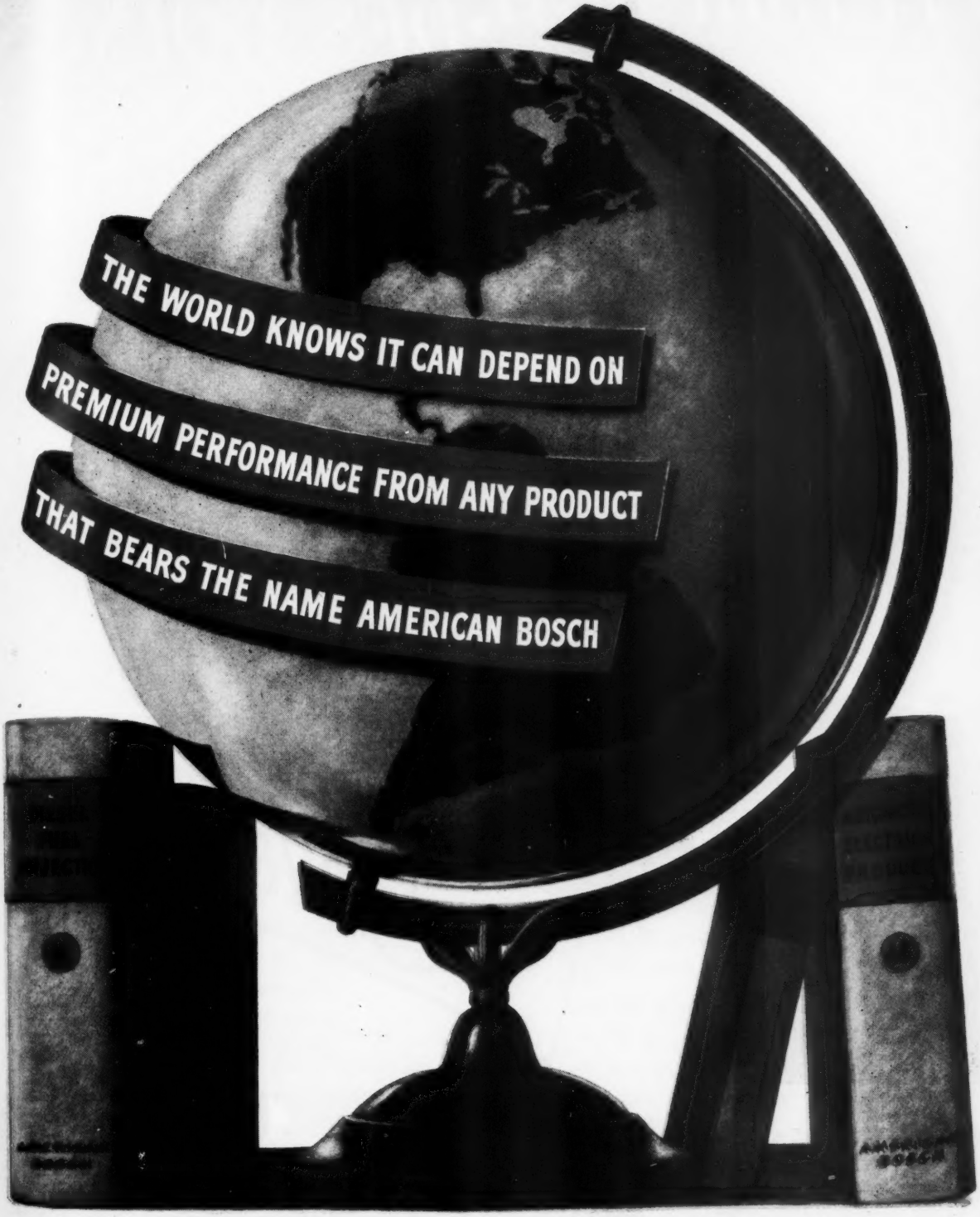
FOR ADDITIONAL INFORMATION SEE OUR INSERTS IN SWEET'S CATALOGS.



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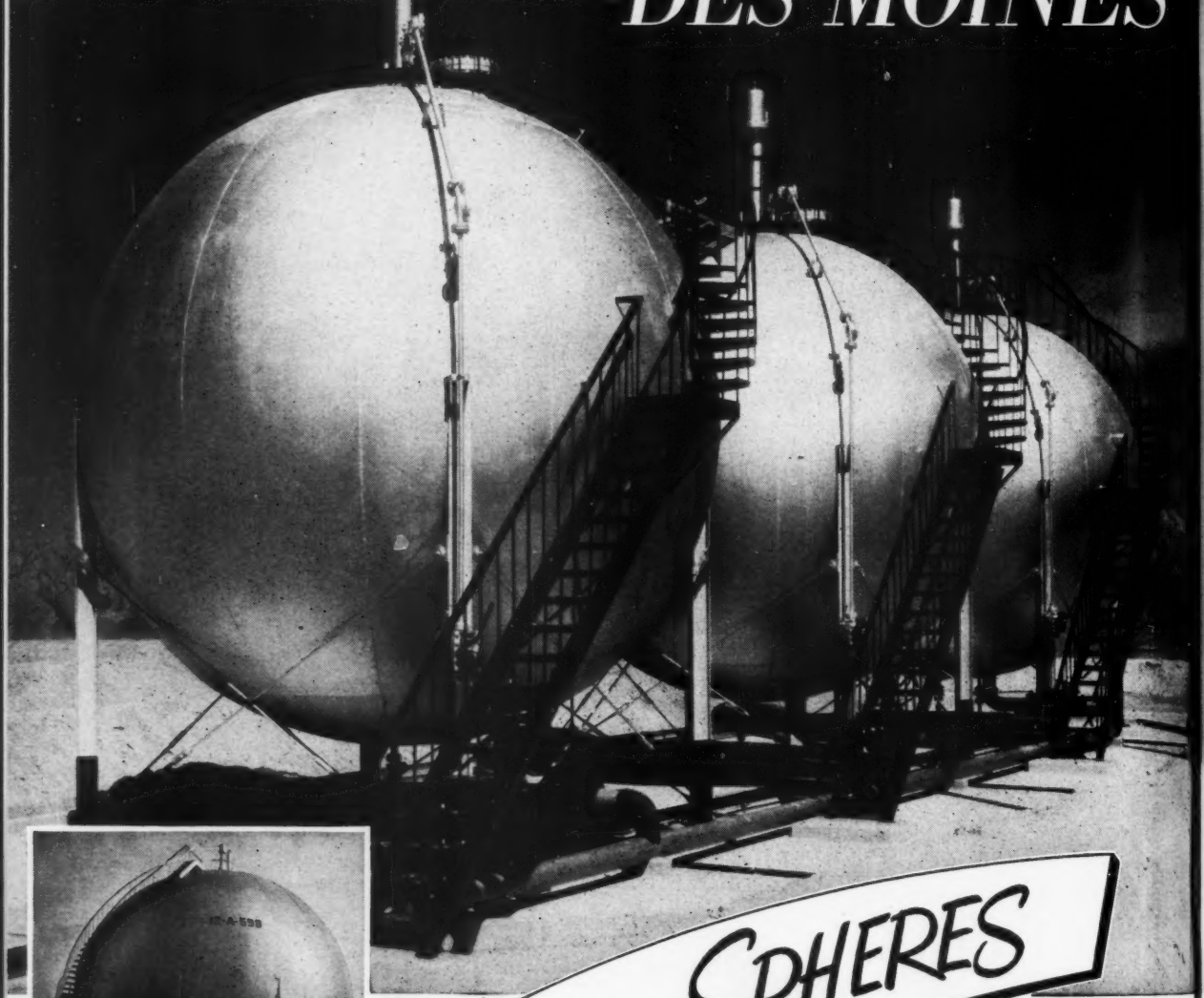

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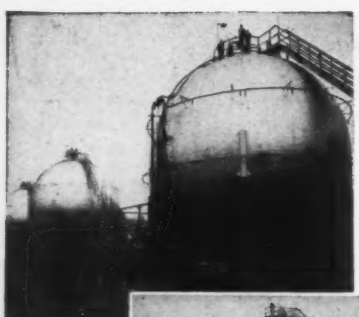

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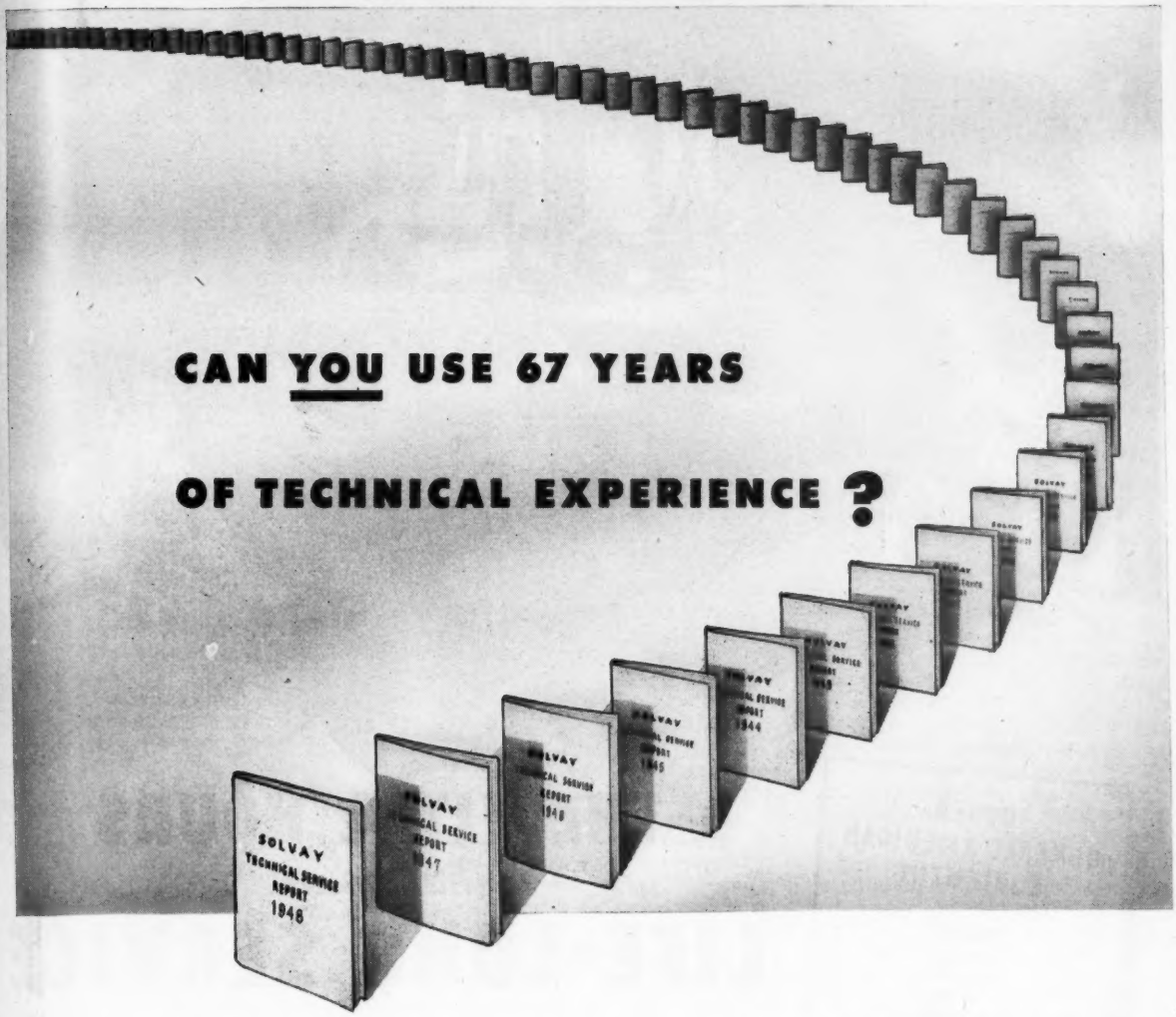

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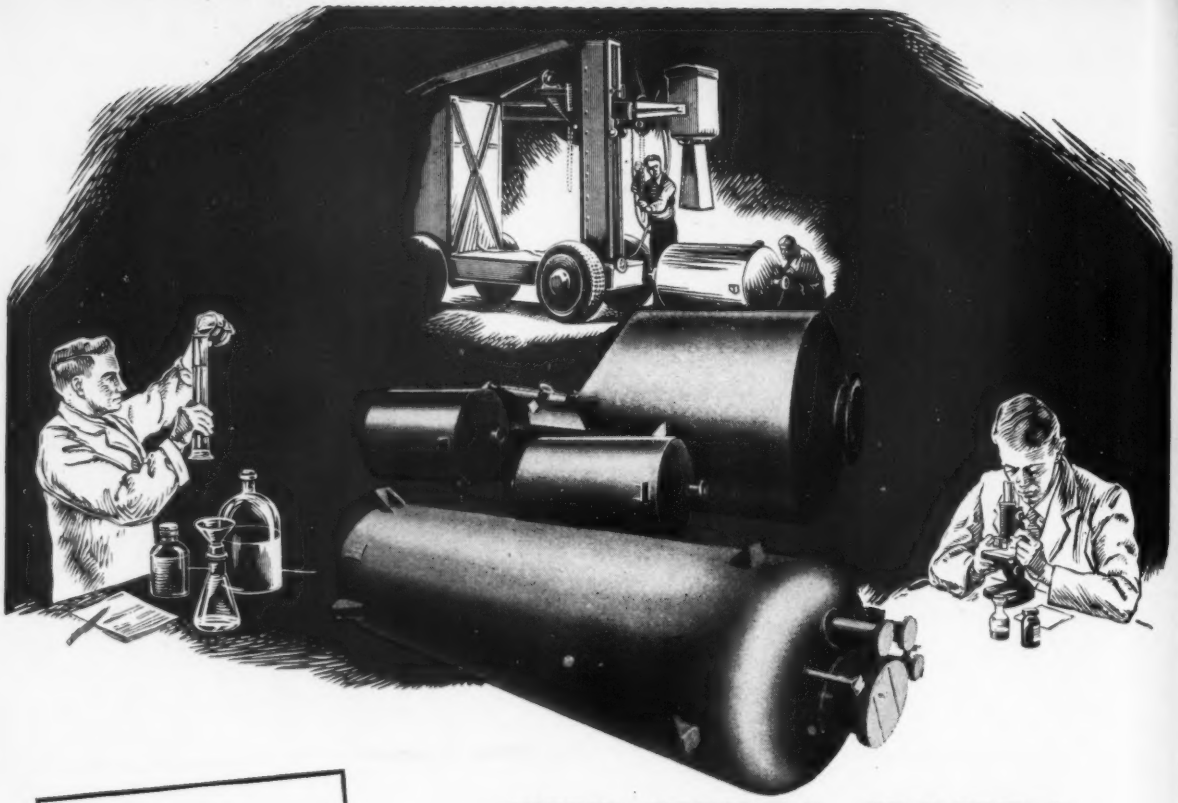

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JOURNALLY Speaking

How's Your Cycle?

IF your business feels funny this week it is because of position of the planets. We are assured of this by an individual in Hollywood, Calif., who calls himself "The Cycle Man," and who says he finds "through astronomical analysis and experiences, the planet Neptune sources oil by vibration, the planet Uranus the drilling of oil, etc."

We aren't going to buy his service regularly until we find out whether he predicted the recent election any better than Dr. Gallup, but his sample copy informed us:

"A whole new oil cycle began August 30, 1948. It progresses until November 12, 1948, and then subsides until June 11, 1949. Forward from that 1949 date, for 7 years, with new science and inventions, with the oceans figuring as never before, the oil industry will be sensationally successful.

"Warning! Forward from September 18, 1948, and lasting until November 21, 1950, is harvest time for oil mistakes and mismanagements of the past 7 years. The old will fail—the new will succeed—particularly in Oklahoma, Texas, Louisiana, New Mexico, and California—this 1948-1950 period. No more oil organizations along old lines after September 18, 1948. All oil organizations, with radar, new drilling hits—cycles which reveal oil causes above that make oil effects below as guides—should be reorganized before November 12, 1948."

There was more, but this much had us going around in cycles.

Aw, Tell Us

WHEN Socony-Vacuum Oil Co. held a meeting of 250 of its top brains and brass they let us have a picture of the gang (which we draped across two pages recently) but wouldn't give us copies of the papers and reports presented.

It may be all well and good to keep company secrets within the family, but we sure wish they had slipped us the text of the speech made by Prof. Leo Wolman of Columbia University. His subject was "Wages, Prices, Economic Trends and Where They Are Taking Us." We've puzzled over that ourselves more than once, and we don't think it fair for Socony-Vac to keep the answer all to themselves.

Paper Progress

IF talk makes progress, petroleum is certainly a progressive industry. We doubt that any other industry has so many associations, societies, and institutes which hold so many conventions in so many places with so many speakers on so many subjects. And most of them come at this season of the year.

You may have noticed that a good many pages of our favorite oil paper during recent weeks have been devoted to reports of meetings, plus solid sections of formal digests set in six-point type in the anterior portion of the book. We can't cover every paper at every meeting, but we do the best we can because we believe that this kind of talk does promote progress. The exchange of ideas, and discussion of problems and their solutions, which take place at oil-industry conventions is no small factor in keeping the industry progressive.

A.P.I. Footwork

A COMFORTABLE pair of old shoes is essential equipment for attending an A.P.I. convention, according to our foot-weary editors who limped back from Chicago last week.

You could see anyone you wanted to find if you stood long enough in "Handshake Row" in the hotel lobby, and groups in every corridor gave the impression that most of the convention business was being conducted by "standing committees." We envy those who sat in the group sessions and got their work done notwithstanding.

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Industry at Work

POSSIBLY the most reassuring reaction that comes from an annual meeting of the American Petroleum Institute is that, regardless of the confusion that may exist as to matters having to do with political and economic trends and international policy, the oil industry is always at work.

Starting several days in advance of the annual assembly, committees, many of long standing, meet. Often members complete their work and return to their essential jobs in the laboratories, fields, plants, and along the pipe lines before the convention opens. It may not appear important to some what committees on "Gaging and Strapping Spherical and Spheroidal Tanks" or "Disposal of Refinery Wastes" do, but it is.

These and more than 100 other committees are the front line in technical progress. Their members are specialists of long training and experience, and through their collective efforts they bring about accomplishments without which there can be no industrial growth.

We wondered how many thousands of man-hours were represented in the findings explained at the refinery symposium on rapid methods of analysis, to which an entire session was devoted. Several new methods of approach in analyzing petroleum and its fractions have been perfected and more are in the making. Specialists in this field are doing more and doing it faster, and the entire industry should know about it.

The oil industry generally and most of its customers give little thought to lubricating oils, but hundreds of technicians, including graduates and postgraduates of scientific schools, are concentrating on how to solve the many lubrication problems that are constantly arising in a world that is more and more mechanized. The same situation applies in motor fuels and all the other products which are constantly being improved.

In production, at Chicago reports were presented at committee meetings and division sessions dealing with specific developments as well as over-all findings. They reflect a gradual evolution in practices which often represent the difference between failure and success in drilling for and producing oil.

Furthermore, as reflected in the A.P.I. reports, there are new tasks in transportation and distribution and many other activities. Hundreds of thousands of dollars are being spent yearly in studies of fire protection and safety in oil operations.

All these specialized and coordinated activities add up to sustained growth which in the oil business has continued in both good and bad times. They are the work of men and women whose individual jobs do not loom large in a multibillion-dollar world industry supplying more than 3 billion barrels of petroleum yearly.

But collectively they account more than anything else for the accuracy of that public relations slogan, "Petroleum Is Progressive."

No Opposition Has Developed to Order Closing 17 Texas Fields

by Leigh S. McCaslin, Jr.

HOUSTON.—Orders to halt or limit production in 17 Texas oil fields accounting for one-sixth of the state's production were authorized last week by the Railroad Commission.

In making this important announcement, commission member Olin Culberson said, "We have now reached the place where with increased stocks of gasoline and crude oil above ground and increased demand, Texas can fill all of the crude-oil demands made on her. It is the opportune and logical time for the commission to carry forward its expressed intention of stopping the flaring of casing-head gas."

The commission charged that in the fields involved "there is being wasted 238,000,000 cu. ft. of casing-head gas daily incident to the production of 394,000 bbl. of oil per day." Fields concerned and their reported July production in barrels are as follows:

District 2, Southwest Texas: South Caesar, 46,340; and Heyser, 160,487.

District 3, Gulf Coast: Conroe, 1,592,242; North Withers, 246,519; and Magnet Withers, 234,051.

District 4, Southwest Texas: Flour Bluff, 60,228; Tijerina Canales, 351,-110; and La Gloria, 334,102.

District 8, West Texas: North Cowden, 640,190; Foster, 702,079; Fullerton, 1,236,506; Goldsmith, 908,476; Levelland, 702,056; McElroy, 909,331; Seminole, 684,739; Slaughter, 1,689,-089; and Wasson, 2,449,333.

Separate orders for each of the 17 fields are being prepared under the direction of Jack Baumel, chief engineer of the commission's oil and gas division. At the regular monthly allowable hearing in Austin, Monday, Commission Chairman E. O. Thompson stated he did not know how long it would take to prepare the orders. Commission members declined to disclose the effective date of the orders or any details concerning them.

Little Opposition

Expected opposition to the shut-down orders failed to develop at Monday's hearing. Some observers think that the operators are "holding their fire" until they know the details of the orders, these quarters believing that perhaps the action may not be so drastic as to cause serious concern. On the other hand, a commission member expressed the belief that the lack of opposition was because of the fairness and logic of the authorized action.

Operators concerned presented testimony before the commission October 26 as the result of a show-cause order requiring them to explain why the fields should not be closed in. Information disclosed at this hearing revealed that considerable progress has been made during the past 2 years toward utilizing all casing-head gas where economically feasible. In 12 of the 17 fields, gasoline plants are in operation. Thus the gas involved in these cases is largely plant residue, which the commission feels is already concentrated and in a position to be utilized.

(For details concerning the operators' testimony at this hearing see "Flare-Gas Waste Greatly Reduced, Operators Tell Texas Commission," Dahl M. Duff, The Oil and Gas Journal, November 4, 1948, p. 49).

Reaction of Texas operators to the orders halting production was swift. Most cited the fact that gas conservation programs in many instances have been retarded by such problems as unavailability of equipment, constantly increasing production to meet post-war demand, labor shortage in some skills and some areas, and lack of an economically attractive market in some cases. Operators feel that the many cycling and pressure-maintenance plants built since war's end are sufficient evidence of good faith.

Action Based on Court Decision

One opinion was expressed that the commission was curtailing production in the 17 fields as a "back-door" method of cutting oil output. A state-wide reduction in allowables has been rumored and even commented upon by commission members for some time.

The present action is an outgrowth of court action over the past few years with regard to Seeligson field, Jim Wells County. The commission attempted to close this field down, but operators enjoined it from enforcing the act and were upheld by the Texas Supreme Court. However, the court did hold that the commission has the power, where exercised reasonably, to close down an oil field in the interest of conservation. Hence, the present action is based upon this decision.

Full text of a statement made by commission member Olin Culberson last week when the shut-down orders were authorized is as follows:

"For many years the flaring or burning of casing-head gas produced with oil has been prevalent in Texas. The Railroad Commission of Texas had no authority to stop this practice until the present commission in the Seeligson case established the fact that in that case, and others that may be similarly situated, waste of valuable liquid hydrocarbons was taking place. The action of the commission in the Seeligson case came after some 2 years of investigation, preparation, and warning to the industry that such action might be expected.

"Since the Seeligson case decision the commission has held hearings on the fields where it was deemed economically feasible to utilize and save casing-head gas. In many of these fields extraction plants have been erected to the extent of more than 100 which are now or shortly will be gathering flare gas from oil wells and processing same. There is no waste of a single foot of natural or dry gas, this being a gas coming from a reservoir containing no oil.

"Recently at a hearing held on October 26, 1948, some 17 fields were cited to appear and show cause why they should not be closed in until such time as they are prepared to conserve the flare gas that is produced as an incident to the oil production therein.

"The commission has extended its intention and determination to stop the flaring of casinghead gas and has waited until the consuming season for oil and the acute demand that has existed therefore had passed. The operators of Texas have been given several years to get ready for this situation.

"We have now reached the place where with the increased stocks of gasoline and crude oil above the ground and the decreased demand Texas can fill all of the crude-oil demands made on her. It is the opportune and logical time for the commission to carry forward its expressed intention of stopping the flaring of casing-head gas.

"Orders are today being prepared by the Railroad Commission covering the fields already heard and flaring in such fields will be stopped. The Railroad Commission is intent on seeing to it that every bit of flare gas from oil wells shall be saved wherever the volume is great enough to make it reasonable and economically feasible to gather it in any oil field in Texas."

Sinclair Posts Price For New Wyoming Pay

Sinclair Wyoming Oil Co. has posted a price for crude from the recently discovered Cambrian pay in Wer[illegible] field of Wyoming, effective as of October 28. The schedule carries $2.10 for below 20° gravity and $2.52 for 40° gravity and above with a 2-cent differential for each degree change in gravity.

Action on Crude Prices Seen as Hanging in Balance This Week

AT no time since Phillips Petroleum Co. raised its price for crude oil 35 cents per barrel on September 28 has the industry been faced with so many conflicting rumors regarding the immediate price outlook.

Early this week there were many reports that a certain major company would post a general increase in its prices as soon as it completes negotiations currently under way to sign up a number of long-term contracts for the purchase of crude in strategic areas, and that this would soon be followed by other purchasers.

Offsetting this, officials of several companies denied that any increased price was imminent, and many oil executives expressed the view that it is improbable that there will be a general price increase in the near future despite the pressure being applied in many places.

The supply situation, including the problem of storage, was pointed to by many as not supporting a higher price level for crude oil. It is generally acknowledged that stocks are adequate to supply the demand throughout the winter in all areas if refinery activity continues at its present rate.

On the other hand, the threat of the Texas Railroad Commission to curtail crude production in 17 fields yielding at present upwards of 400,000 bbl. per day, if carried out and sustained, would seriously impinge upon the supply of crude. Some observers feel that the supply of crude is so nearly in balance with demand that any curtailment would react quickly in a scramble for crude and higher prices generally.

The consensus of executives of larger companies seemed to be that a crude-price increase of compelling breadth is possible but not probable within the current week.

Tangible support to rumors of an impending break in the stalemate came from a letter given wide distribution November 14 by H. P. Nichols, executive vice president of the East Texas Oil Association, Tyler.

This asserted that a major purchaser will post an increase of 35 cents per barrel for the entire state of Texas if assured not less than 10,000 bbl. per day of East Texas crude. Nichols urged producers to notify him how much crude they would sell at $3.00 per barrel (35 cents above the present posted price in East Texas) and how soon they could make pipe-line connections.

The letter stated that the unnamed company has a complete gathering and pipe-line system and operates throughout the state, that it will contract for the 10,000 bbl. per day for 1 year, and that it will agree to meet any price increases which may be posted by any other major purchaser during the life of the contract.

Some Penn Grade Crude Cut 54 Cents per Bbl.

OIL CITY, Pa.—The posted price of Zanesville Pennsylvania Grade crude oil was cut from $4.49 to $3.95 a barrel effective November 16 by Valvoline Pipe Line Co. of Freedom, Pa.

George Hanks, president of South Penn Oil Co. of Bradford announced that Joseph Seep Purchasing Agency of Bradford is not changing its posted prices of other grades of Pennsylvania crude oil.

He said the firm is trying to hold the line on the prices. Joseph Seep Purchasing Agency, a division of South Penn Oil Co., does not buy Zanesville oil.

E. M. Craig, president of Freedom Oil Co. of which Valvoline Pipe Line Co. is a division, said the cut in Zanesville was made because the "supply exceeds the demand."

This is the first change in the price of Zanesville crude since December 16, 1947, when the posted price was increased 4 cents, from $4.45 to $4.49 per barrel.

California Strike Cost 10 Days' Supply on Coast

Daily average crude runs at California refineries for the month of September were 36.3 per cent below the average for August according to the September petroleum statement released by the California office of the Bureau of Mines. Crude runs in September averaged 565,367 bbl. daily compared with 887,064 bbl. daily in August.

Total crude processed for the month amounted to a little less than 17,000,000 bbl. while the total at the August rate would have been about 26,600,000 bbl. Thus, the strike resulted in a decrease in product production amounting to about 9,600,000 bbl. or enough to supply the West Coast area for about 10 days.

B. of M. Sees Drop in November Crude Demand

THE U. S. Bureau of Mines forecast of crude-oil demands in November 1948 reflects a decline of 60,000 bbl. per day from the forecast for the previous month. The bureau estimates that in November consumers of domestic crude petroleum will require 5,560,000 bbl. daily, whereas in October it estimated 5,620,000 bbl. daily would be consumed.

The November forecast includes estimates of total gasoline demand of 74.6 million barrels, total crude runs to stills of 5,680,000 bbl. daily, and a gasoline yield from crude of 40.1 per cent.

Incomplete current data for September indicate a probable demand for domestic crude oil of 5,320,000 bbl. daily and total runs to stills of 5,420,000 bbl. daily, a decline from the August demand which was 5,525,000 bbl. daily and August crude runs which were 5,621,000 bbl. daily, due largely to reduced refinery operations in California. The forecast for November assumes a return to normal operations with a seasonal decline in crude-oil exports and with crude-oil imports at about the rate of 391,000 bbl. daily.

Total stocks of refined oils appear to be about 48 million barrels greater on October 31 than a year ago. An increase of 20 million barrels in stocks of residual fuel oil is out of line with the static demand for that product; however, about 11 million barrels of the increase was in California.

A large portion of the decline in the bureau's forecast of crude-oil demands is assigned to Texas where estimated demand will drop from 2,500,000 bbl. daily in October to 2,460,000 bbl. daily in November; estimated demand in California dropped from 965,000 to 960,000; Louisiana, from 502,000 to 500,000; Oklahoma, from 438,000 to 436,000; Wyoming, from 153,000 to 150,000; and New Mexico, from 138,000 to 134,000.

December East Texas Allowable Down 9,333 Bbl.

AUSTIN.—Texas oil allowables for December will remain unchanged except for District 6 (East Texas), according to an order of the Texas Railroad Commission early this week.

Total net crude-oil allowable for the state in December will be 2,674,539 bbl. daily.

A decrease of 9,333 bbl. in the daily average production is effected in the East Texas field allowable because of the 31-day month of December as compared to the 30-day month of November. The field is on a 20-day operating schedule.

Coal Gasification Plant Opening Heralds New Effort of Industry

THE coal gasification pilot plant of Pittsburgh Consolidation Coal Co. at Library, Pa., designed and built in cooperation with Standard Oil Development Co., was formally opened November 16, marking the first serious efforts of private industry to produce liquid fuels from coal in the United States.

Joseph Pursglove, Jr., vice president of Pittsburgh Consolidation in charge of research and development, told a visiting group of business executives that the work of this pilot plant and its research laboratories is directed primarily to the broad fields of coal carbonization and gasification, together with chemical and processing studies on tars produced by carbonization.

The pilot plant is designed primarily to develop techniques for producing so-called synthesis gas which in turn could be liquefied into gasoline or other liquid products. At nearby Imperial, Pa., the company has another pilot plant working on coal chars, tars, and gases produced by other processes.

"While coal gasification has been the most widely known of the company's projects," Pursglove said, "some of the things we learned early in our work on coal research have convinced us of the need for a broad approach. Obviously, we are not yet at the point where conclusions can be reached, but our findings so far show that coal carbonization warrants as much attention as coal gasification.

"The objective of the company's present research program is to devise new ways of processing coal to make products of greater value. Success will be reflected in new markets for coal. Meanwhile the pressure of growing energy demands is expected to increase the use of coal in natural form."

New Techniques

One of the new techniques embodied in the pilot plant is the handling of solids in a fluidized state, which enables continuous operations with coal under closely controlled conditions. The primary purpose of the large experimental operation is to study operability of the fluidized coal gasification process in order to reach conclusions regarding costs and commercial designs. It was pointed out that many large and complex problems must be solved, and their solution may require radical alteration of the present equipment.

In the pilot plant at Library, gasification is accomplished by the reaction of steam and oxygen with fluidized coal (or char) at a high temperature. The resultant product is a mixture of carbon monoxide and hydrogen and is known as water gas, or "synthesis gas." Produced commercially, this gas may be sold direct for low B.t.u. fuel uses or for metallurgical purposes; or it may be enriched to the equivalent of manufactured city gas; or it may be fed to a Fischer-Tropsch synthesis reactor for the production of gasoline and chemicals.

This last step—the production of gasoline from coal—has received much attention. In referring to this phase of the subject, Pursglove said:

"As now projected the over-all conversion costs to synthetic gasoline from coal are not competitive. Therefore, when the process is perfected, sound economic commercialization of this phase of coal conversion will be conditioned by price factors prevailing in the fuel markets at that time."

Half of ECA Procurement Will Come From U. S.

WASHINGTON.—Procurement programs covering more than $43,500,000 worth of oil and products were approved by the Economic Cooperation Administration during the first 10 days of November, with slightly more than half of the total to be provided from United States resources.

The largest single commitment approved by the ECA during the period was $13,800,000, for procurement of crude and products in the United States by the United Kingdom.

Other large commitments included $2,700,000 to Norway, for crude and products from this hemisphere "other than U. S., Canada, Venezuela, Argentina, Brazil, Cuba, Mexico, Uruguay, Chile, and Peru," and $300,000 for crude and products from the United States; $6,600,000 to France for crude and products from Venezuela, $8,400,000 for crude and products from Saudi Arabia, and $2,648,000 for crude and products from the United States; $920,000 to the French Zone of Germany for purchases in Saudi Arabia and $760,000 for purchases in the United States; $1,220,000 to the French Overseas Territories for purchases in the United States and $300,000 in Saudi Arabia; and $4,325,000 to French North Africa for purchases in the United States. Greece was given $1,500,000 for purchases in the United States and $104,100 for motor gasoline from Saudi Arabia.

These commitments brought the total allocation for crude and products from the inception of the program until November 10, to $283,306,000.

Oxygen Plant in Place for Coal-to-Oil Demonstration

A tonnage oxygen plant, the first to be used for coal gasification purposes in this country has been brought from Hochst, Germany, and will be placed in operation in a few weeks by the U. S. Bureau of Mines at the coal-to-oil demonstration plants at Louisiana, Mo.

Feasibility of using oxygen in the production of synthetic oil and gasoline from coal depends entirely, according to Bureau engineers, upon the cost of oxygen, and the Linde-Frankl unit brought from Germany has a capacity of 23,000 cu. ft. or 1 ton per hour of 98 per cent oxygen.

Originally the unit was used by I. G. Farbenindustrie in making acetic acid and other chemicals. It was dismantled and shipped to the United States complete save for building, piping, and other materials available here.

Jester Reactivates Body To Oversee Butane Sales

AUSTIN.—The emergency fuel commission which functioned last winter to insure butane gas distribution has been reactivated by Gov. Beauford H. Jester.

Jester termed the move a precautionary measure only. At the same time he set a meeting for November 23 in Austin to which he invited all Texas butane producers and dealers. Purpose of the meeting is to survey butane supply and demand.

Members of the commission, all state officials, are: William J. Murray, chairman; John H. Winters, Dr. George W. Cox, and Homer Garrison, Jr.

Texas Gas Allowable Set 6 Per Cent Above October

AUSTIN.—Daily gas allowable for Texas for November is 6 per cent higher than the October allowable.

Practically all fields which are given fixed allowables received an increase for November. Largest increases are for Needville, Carthage, Rodessa, Waskom, Whelan, and Edet fields. Reduced allowables are in effect for the Blue Lake and Old Ocean fields. The Upper Yates sand of the Weiner pool in District 8 was added to the prorated list and given a daily allowable of 4,340,000 cu. ft.

this week

PRICES—Rumors of imminent action to increase the price of crude keep the industry uneasy. . . . No major company would admit it plans to post an increase. . . . East Texas association announces one major will soon boost price throughout Texas. . . . ¶Sun Oil Co. head defends previous crude price increases and present level of industry earnings. . . . ¶Price of Penn Grade crude cut in one field. . . .

PRODUCTION—Texas Railroad Commission prepares orders closing 17 oil fields alleging gas waste. . . . Does not change state allowables. . . . ¶Bureau of Mines forecasts lower demand for crude oil. . . . ¶California refinery strike cost West Coast only 10 days' supply. . . . ¶First industry-owned pilot plant working on synthetic fuels from coal goes into operation. . . .

GOVERNMENT—Industry men foresee few radical changes in administration policies as result of election. . . . ¶A.P.I. speakers urge closer cooperation of oil industry with Government as best way to forestall unwanted regulation. . . . ¶New attempt made to get steel industry to allocate materials for oil uses. . . . ¶Small business investigating committee, which probed oil marketing last year, will be continued. . . .

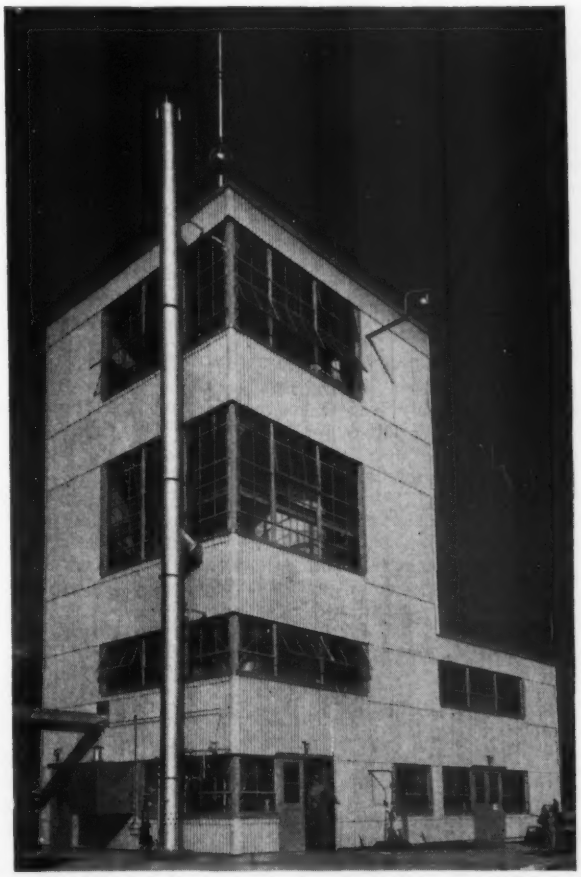
TRANSPORTATION—Two separate studies indicate world tanker fleet will balance expected needs during next several years. . . . Vessels on order should take care of retirements and growth in ocean movement. . . . ¶Completion of Middle East pipe lines on schedule seen as necessary to avoid tanker shortage. . . .

INTERNATIONAL—American operators participating in Western Canada's exploration play are confronted with leasing and other regulations unfamiliar at home. . . . ¶Oil-company expenditures of $1,500,000,000 in Middle East over next 5 years termed a "Junior Marshall Plan." . . . ¶Oil-industry labor problems being considered by petroleum committee of International Labor Organization. . . .

TRENDS—Stocks of four major products for week ended November 6 were up 1,832,000 bbl. . . . Compares with 460,000-bbl. increase for comparable period year ago. . . . Only product showing decline was gasoline, down approximately 500,000 bbl. . . . Drop in gasoline stocks reflects firm demand largely from harvesting and winter wheat areas. . . . Major gain in stock levels reported in distillate. . . . ¶Outlook for kerosine brightens somewhat. . . . Stocks show gain of 175,000 bbl. . . . Refinery output up 278,000 bbl. . . . Kerosine yield reaches 6.1 per cent compared to 5.3 per cent for previous week. . . . ¶Crude production for week ended November 13 was down slightly but still above 5,600,000 bbl. daily. . . . ¶Crude runs for California during September strike were down 36 per cent. . . . ¶Marketers looking to winter temperatures to put life in currently slow-moving materials. . . .

REFINING—Construction gets under way on Ohio Standard's products and crude-oil storage terminal at Cleveland. . . .

PIPE LINES—Stricter pipe-line regulations indicated in report to A.P.I. by member of Interstate Commerce Commission. . . . ¶A.G.A. survey shows large postwar growth in public-utility pipe lines. . . . ¶Pemex Poza Rica-Mexico City pipe line scheduled for completion next February. . . . ¶Oklahoma Natural Gas nears final linking of company's main transmission line with Golden Trend fields in southern Oklahoma. . . .



This week American industry began its first major effort to produce synthetic liquid fuels from coal with the opening of the pilot plant, pictured here, constructed jointly by Pittsburgh Consolidation Coal Co. and Standard Oil Development Co. at Library, Pa. The plant is now developing methods of making synthesis gas, first step in producing liquid fuels. At the same time the Bureau of Mines is erecting captured German equipment at its synthetic fuel experiment station at Louisiana, Mo.

Completion of Major Pipe Lines Will Relieve Tanker Shortage

by Dahl M. Duff

NEW YORK.—The tanker situation, which was a cause of concern a year ago, appears to have worked itself out.

Barring a major upset in the world petroleum situation, industry experts believe that transportation needs will be pretty well met over the next few years, provided the major pipe lines now under construction or planned in the Middle East are completed on schedule.

It is estimated that four lines which are to be finished by 1953, with an aggregate capacity of more than 1,000,000,000 bbl. daily, will eliminate the necessity of building some 250 T-2 tankers, with a substantial saving in steel.

Reflecting the general improvement in all phases of petroleum-industry supply, a statement in New York by M. G. Gamble, manager of the marine department of Standard Oil Co. (N. J.), predicted that any serious shortage of tanker transportation is unlikely during the coming winter.

The research division of the Association of American Shipowners, in one of a series of studies of economic problems of the American merchant marine, forecast that the United States tanker fleet will level off at about 6,000,000 deadweight tons by 1953, largely because of the growing differential between the cost of operating United States and foreign vessels.

Supertankers to Come

Sun Shipbuilding & Dry Dock Co. announces that the first of America's new supertankers, the Esso Zurich, will be launched December 4, and in New York, the Stevens Institute of Technology completed model tests of an even larger 720-ft. tanker which will be the fourth largest commercial ship afloat, when built.

In his statement, Gamble said that under peacetime conditions, tankers now available with deliveries of vessels reasonably expected "will very closely balance transportation needs over the next few years." He made clear that this prediction is based on the assumption that the various projected Middle East pipe-line projects will be carried through to completion.

There will be a saving of approximately 40 cents per barrel in transportation charges for crude oil when the pipe line connecting the Persian Gulf area of Arabian American Oil Co. with its terminal in Lebanon is completed according to information disclosed by Gamble.

It was explained that the present tanker rate from Ras Tanura, the Persian Gulf shipping terminal of Arabian American, to New York City Harbor area is $1.74 per barrel. This includes an 18-cent Suez Canal toll. The present rate from the same point to Southampton, England, is $1.50 which compares with a 75-cent rate from Haifa, Palestine, to Southampton. If the pipe-line charge from the Persian Gulf to Lebanon is calculated at 30 to 35 cents per barrel, the saving at this time would be about 40 cents per barrel.

Some Tankers Tied Up

"The tanker tonnage position today is very much different from what it was a year ago," Gamble said. "At that time we were in the throes of transition of the war-built fleet from Government to private ownership and many tankers were immobilized until the completion of this transition several months ago. During recent months, our problem has been to find use for the surplus tanker tonnage, as private companies were forced, because of lack of business, to tie up from 60 to 70 tankers. The oncoming heating season has partially corrected this situation and a number of tankers have been taken out of tieup. However, in spite of this more recent trend, I believe it unlikely that a serious shortage of tanker transportation will develop during the coming winter period."

Assuming average tanker life at 20 years and a 3 per cent annual growth factor in petroleum transportation requirements, Gamble said about 100 equivalent T-2's are required annually. To show the balance between construction and requirements, he said information indicates 115 T-2 equivalents are under construction or on order in the United States and 286 of the same type in Europe. This is a total of more than 400 scheduled for delivery over the next 4 years, or an average of about 100 a year.

The Association of American Shipowners cited that construction of pipe lines in the Middle East as a factor in diminishing the world need for American tankers. It said owners of American vessels must be prepared to retire older and less efficient units since the expansion of foreign fleets will displace some American tonnage.

The study pointed out that, despite the greater efficiency of the larger tankers now under construction, costs of operation shut American ships out of competition with foreign vessels. Wage costs of an American T-2 tanker, it said, are $200,000 annually, compared to $75,000 for British or Norwegian vessels, and annual cost differentials in nonwage items average $50,000 for a vessel. "What this amounts to is that the American-flag operator must absorb about $15,000 a month of additional operating costs for each tanker in service."

The Esso Zurich, which will be launched at Sun Shipbuilding & Dry Dock Co.'s central yard December 4, will have an over-all length of 628 ft. and a deadweight tonnage of 26,100. Cargo capacity will be 230,000 bbl. as compared with 141,000 bbl. for the war-built T-2's. The vessel is one of four being constructed by Sun Shipbuilding for Standard Oil Co. (N. J.). The company also will build seven for Tankers Navigation Co., Inc., two for Gulf Oil Co., and two for Sun Oil Co.

The ship for which model tests were completed at the Stevens Institute is to be built by the Shipbuilders Co., Inc., of New York, and reportedly will be chartered by American oil interests. Tentative plans are for a draft of 30.6 and 33 ft., with corresponding displacement of 47,000 and 51,000 tons.

Operators Ask Increase For Fullerton Field

AUSTIN. — Operators in Fullerton field, Andrews County, West Texas, have asked the Railroad Commission to increase the allowable of 40-acre wells in the field from 66 to 75 bbl. per day.

A reduction of the allowable from 75 to 66 bbl. per day was made last July 1 by the commission although the MER was 75 bbl. daily. Reason given for this action was to hold casing-head gas production to 70,000 M.c.f. daily, the capacity of the gasoline plant in the field.

The request for a return to the former higher figure is based by the operators on an increase in gasoline plant capacity since July 1.

Texas A. I. M. E. to Meet

HOUSTON.—Texas sections of the American Institute of Mining and Metallurgical Engineers will hold a joint meeting December 16-17 at the University of Texas. Petroleum engineering students and faculty of the university will serve as hosts for the meeting which is alternated annually between the university and Texas A. & M. College.

Foreign Oil Availability Cuts Fourth-Quarter ERP Quotas

by Bertram F. Linz

WASHINGTON.—Taking advantage of the increased availability of crude and products from sources outside the United States, the Office of International Trade last week set up fourth-quarter quotas for the Marshall plan countries and territories 1,851,000 bbl. less than those for the third quarter.

The total export quota of 14,180,000 bbl. was 395,000 bbl. under the third-quarter total of 14,575,000 bbl., and close to the second-quarter level of 13,949,000 bbl.

The OIT cut something over 2,500,000 bbl. from the third-quarter allocations to individual countries but increased the undistributed reserve, held against unanticipated needs, by 1,072,500 bbl.

The reductions in the allotments to ERP areas were in line with suggestions from the Economic Cooperation Administration that the OIT take advantage of the increased foreign production to lessen the drain on our own resources.

The third-quarter allocations were somewhat inflated by the necessity of meeting special situations in some areas, such as the need of Curacao refineries for additional distillate to produce special fuel oil for the U. S. Navy and the necessity of supplying the Gander airport in Newfoundland with its winter requirements of aviation gasoline before water transportation was shut out by ice. The quotas for the current quarter are considered to be more in line with worldwide normal requirements.

OIT Allocations

The OIT allocations provided for over-all quotas of 2,000,000 bbl. of crude oil, 220,000 bbl. less than for the third quarter; 1,570,000 bbl. of aviation gasoline, an increase of 165,000 bbl.; 4,710,000 bbl. of other motor gasoline, a cut of 190,000 bbl.; 450,000 bbl. of kerosine, a reduction of 50,000 bbl., and 4,000,000 bbl. of gas oil and distillate fuel, a cut of 200,000 bbl. A previously established quota of 1,450,000 bbl. of residual fuel oil, set up to permit prompt export to relieve the strain of excessive stocks, was the same as for the previous quarter.

Quotas for the ECA countries and territories, except for residual fuel oil, were set up as follows, third-quarter quotas being shown in parentheses:

Belgium and Luxembourg: 100,000 bbl. motor gasoline (unchanged); 120,000 bbl. gas oil and distillate (100,000).

Denmark: 100,000 bbl. motor gasoline (unchanged); 8,000 kerosine (15,000); 100,000 gas oil and distillate (unchanged).

France: 450,000 bbl. crude (1,000,000); 190,000 aviation gasoline (200,000); no gas oil and distillate (120,000).

Greece: 120,000 bbl. motor gasoline

(Continued on page 160)

New Congress to Continue Small Business Committee

WASHINGTON. — Continuation of the House small business committee by the next Congress was promised this week by Rep. Wright Patman of Texas, chairman of the committee from its inception of 1941 until 1947, who will resume that post in January.

Patman said that under his leadership the committee again will concentrate on chain-store restriction through extension of the Robinson-Patman Act, which prohibits discriminatory discounts, allowances and secret rebates. During its 2 years under Rep. Walter C. Ploeser of Missouri, who was defeated for reelection, the committee was inactive most of the time and did nothing toward developing legislation for the small businessman, although on taking it over Ploeser had outlined an ambitious program.

The preliminary agenda for next year, Patman said, calls for amendment to the Robinson-Patman Act to provide full disclosure to customers of all sellers' discounts and to prohibit chain groups deducting from their gross earnings losses incurred as a result of selling below cost to eliminate competitors. The latter provision would outlaw "loss leader" selling.

Currently, the committee is wrapping up the nation-wide hearings held this summer by Ploeser at which testimony was taken from filling station operators, tire merchants and others regarding the practices of their suppliers and their corporate competitors.

The committee's hearings this week took on the appearance of a college seminar, with former "trust-busters" Thurman Arnold, Wendell Berge, and other former and present government officials, college professors, etc., discussing various phases of the monopoly situation, but it is planned also to hear Rankin Peck, president of the National Congress of Petroleum Retailers, and officers of other associations of small businessmen on the specific problems of their respective groups.

Drilling Permits Sought In Gulf of Mexico

HOUSTON.—Four major oil companies have applied to the Department of the Army for permits to drill exploratory wells in the Gulf of Mexico and a fifth concern has asked a permit for seven wells in Tabbs Bay.

Shell Oil Co., Inc., has applied for approval for revised plans for drilling 3½ miles northwest of Pass A Loutre Light, approximately 12 miles northeasterly from Pilottown, La., The Ohio Oil Co. has asked for a blanket permit to erect drilling structures in a 2,880-acre area lying 35 miles southwest from Freeport, Brazoria County.

Pan American Production Co. has requested permit to drill a well in the Gulf approximately 63 miles southwesterly from Abbeville, Vermilion Parish, La. In Tabbs Bay, Humble Oil & Refining Co. proposes to drill seven wells in that part of the bay formerly known as Gaillard Peninsula, 2 miles south of Baytown, Harris County.

The California Co. has applied for a permit to drill a test well in the Gulf of Mexico approximately 19 miles east of Venice, Plaquemines Parish, Louisiana.

First Arrest Made in Gulf For Illegal Exploration

HOUSTON. — Bascom Giles, commissioner of Texas General Land Office, has announced the first arrest for discharge of explosives in geophysical exploration in Gulf Coast waters without a permit. Giles said that charge had been filed in Jefferson County court against a representative of the McCollum Exploration Co. of Houston while operating from the exploration boat Gimmick.

Giles pointed out that it is illegal for explosives to be used in geophysical work without a permit from a county judge and that regulations prepared under his (Giles) supervision further limit explorations to leases owned by the company conducting the exploration. He stated that no school-land leases have been issued to anyone in the general area in which the arrest was made. Giles said he was asking the state attorney general to lend assistance to his department to obtain a speedy prosecution of the case.

Middle East "Junior Marshall Plan" Costs Taxpayers Nothing

ARABIAN AMERICAN OIL CO. and other companies engaged in petroleum operations in the Middle East are in effect financing a "Junior Marshall Plan" for the area with investments totaling about $1,500,000,000 over the next 5 years.

This phase of Middle East oil development was discussed by W. F. Moore and B. E. Hull, president of Arabian American and Trans-Arabian Pipe Line Co., in a joint statement released November 11 in New York.

While the Marshall plan will assist in the economy of 16 countries with a per capita benefit of $16, the oil development in the Middle East will benefit 10 countries to the extent of $6 to $9 per inhabitant, without cost to the American taxpayer, the statement said. In fact, the taxpayer will also benefit because American companies will be paying substantial income taxes to the U. S. Government, it added.

The two American companies are planning capital expenditures of $520,000,000 in expanding their operations in the area in the next 5 years, the statement disclosed. A total of $320,000,000 is planned for Aramco's producing activities and supporting facilities, and $200,000,000 for the Trans-Arabian pipe-line project.

The statement summarized the advantages to result from construction of the Persian Gulf-Mediterranean pipe line and said it is believed shipments of pipe, held by the failure of the Government to grant further export permits, will be resumed soon.

At present, about 145 miles of the line have been laid, and the 100 miles of pipe remaining in Saudi Arabia are being installed at a rate of about 5 miles a week. Expenditure on the project to date amounts to $70,000,000.

Construction of the line will eliminate the 7,200-mile round-trip tanker voyage around the Arabian Peninsula, the statement pointed out, and the completed 500,000-bbl. daily line will require 200,400 less tons of steel than needed to build the 102 T-2 tankers which would be equivalent to the line's capacity.

"Oil ranks second only to food in importance to the European recovery program, and if all the Marshall plan oil had to come from the Western Hemisphere, rationing in the United States would be inescapable," it said. "In past years large volumes of oil have been shipped to Europe from the United States and South America, providing a strain upon the resources of the Western Hemisphere. American oil reserves are being depleted six times as rapidly as those of the Middle East, which has greater reserves than the United States by some 50 per cent. Now, more and more of Europe's needs can be filled from the Middle East, meaning retention of American oil at home and longer life for American reserves."

I.L.O. Schedules Session On Oil's Labor Problems

WASHINGTON. — Problems affecting labor in the petroleum industry are being discussed at the second session of the petroleum committee of the International Labor Organization which opened November 8 in Geneva, Switzerland.

The conference is to receive a report on recent events and developments in the industry in the various countries and will discuss such matters as recruitment and training for the petroleum industry, safety and health, and the problems of industrial relations as affecting trade union organization and recognition, developments in collective bargaining and actual methods for handling disputes.

The United States delegation includes David E. Longanecker, assistant chief of the petroleum division of the State Department, as one of the two delegates, with Robert E. Friedman, associate director of the Oil and Gas Division, as alternate delegate and adviser.

Employers' representatives in the group are John C. Quilty, manager of industrial relations, Shell Oil Co., New York, and C. Francis Beatty, director, Socony-Vacuum Oil Co., New York, as delegates; and Channing Rice Dooley, Training Within Industry Foundation, Summit, N. J.; Valentine H. Ludwig, general manager, employe relations department, Gulf Oil Corp., Pittsburgh; James W. Rees, assistant vice president, Pure Oil Co., Chicago; and R. B. Roaper, director of safety, Humble Oil & Refining Co., Houston, as advisers.

The petroleum committee is one of eight industrial committees of the I.L.O. established for the purpose of examining social and economic aspects of international labor standards in the respective industries and adopting resolutions for their improvement.

New Swedish Refinery To Be on Stream by Spring

Sweden is expected to save several million kroner a year in hard currency through the petroleum refinery which the Olje Ab Koppartrans is building at Skarvik, near Gotenburg, according to a Reuters dispatch from Gothenburg.

The refinery, which will be largest in Sweden, will manufacture 600,000 tons (12,000 bbl. daily), and it is expected that it will be on stream by next spring. Eventually it is planned to double this capacity.

The Gothenburg dispatch states that this refinery was originally planned for China but was never shipped there. Currently, Sweden's daily petroleum production capacity is about 14,300 bbl., of which 11,000 is turned out by A. Johnson & Co. at Nynashamn.

Sweden's production program calls for the output of plastic products, synthetic rubber, nylon, and fertilizers.

Jackson Made Anglo-Iranian Director

International
WORLD-WIDE OIL DEVELOPMENTS

B. R. JACKSON, who for a period of 15 years has been in charge of the New York office of Anglo-Iranian Oil Co., Ltd., has been elected a director of the company succeeding the late Sir Warren Fisher. Jackson, in connection with his enlarged duties, will continue to have general supervision of the New York office but about April 1 will have his headquarters at the London offices of the company.

Jackson became connected with Anglo-Iranian in 1920 as assistant to the general secretary after discharge from military service following World War I. Previously he had been trained in the legal profession. During a period of several years he was engaged in various company activities in London and in Iran. In 1930 he opened an office for the company in New York City and continued in charge until 1934. Then he made a tour of the Far East with the late Lord Cadman, then chairman of the company. He returned to the London headquarters in 1935 and was placed in charge of exploration.

Jackson returned to the New York office in 1939 when, with the start of World War II, it became increasingly important in the operations of the company. He represented his company in the United States during a large expansion period brought about by the war requirements. Due to these activities he is widely known among oil men in the United States and the Western Hemisphere.

© Bachrach

B. R. JACKSON

Russian Oil Distribution Properties in U. K. Sold

Purchase of the petroleum distribution properties in England of Russian Oil Products, Ltd., by a newly formed American - British company was announced last week in London.

The purchasing company was Regent Oil Co. which was organized earlier this year and is owned 50 per cent by Texas Oil Co., United Kingdom marketing unit of California-Texas Corp., and 50 per cent by Trinidad Leaseholds, Ltd., a British company.

The Russian company is a Soviet retail sales firm. The Regent company said the Russian organization had extensive installations at various points in England, Scotland, and Wales which have been largely idle since the war due to the decline in petroleum imports from Russia. In 1938, Russia exported 36,000,000 gal. of motor fuel to Britain, but in the first 9 months of this year imports from Russia were only slightly more than 9,000,000 gal.

Regent Oil Co. said acquisition of the properties would enable it to carry out an expansion program which has been held up because of inability to obtain steel to build storage and other needed facilities.

Kuwait Crude Production Shows Marked Increase

Production of crude oil in Kuwait by Kuwait Oil Co., Ltd., during September showed another marked rise to 642,607 tons or approximately 158,200 bbl. daily, according to an announcement from the London headquarters of the company.

The September figures compare with a total of 625,846 tons, or approximately 149,300 bbl. daily, in August. Total production for the period January 1 to September 30, 1948, was 3,809,416 tons, or approximately 102,800 bbl. daily average.

At present, according to unofficial but reliable reports in New York, production in Kuwait is slightly in excess of 200,000 bbl. daily.

Qatar Drilling Proceeds Pending Pipe-Line Plans

Petroleum Development (Qatar), Ltd., is continuing drilling operations in Qatar, the Arabian sheikdom on the Persian Gulf, although plans are indefinite as to how the crude oil will be handled when production begins.

Currently, three additional wells are being drilled. No. 7 was down to 3,639 ft. late in October and was standing cemented. No. 8 is still being drilled and was down to 1,518 ft. early in November.

Before any crude oil is delivered for commercial purposes, it will be necessary to construct a pipe line from the Dukham field across the Qatar Peninsula to Jebel Waqrah, and this probably will be held up at least until the Iraq Petroleum Co., Ltd., lines to Haifa and Tripoli are completed. Petroleum Development (Qatar) is an I.P.C. affiliate.

(For other Qatar details see The Oil and Gas Journal, May 20, page 124; April 15, page 58, and June 28, 1947, page 80).

Pure Sells Venezuelan Property to Mene Grande

Gulf Oil Corp. has just announced that its Venezuelan subsidiary, Mene Grande Oil Co., C.A., has purchased all the assets of Orinoco Oil Co., a Venezuelan firm of which Pure Oil Co. owned 75 per cent.

The remaining 25 per cent of Orinoco, also sold to Mene Grande, was owned by a native Venezuelan group. The property consists of 61,400 acres located about 25 miles northwest of Maracaibo, Venezuela, with two flowing wells with a combined daily average production of about 323 bbl. As of June 31, 1948, the two wells had produced a cumulative total of about 501,342 bbl. since the first well was completed in 1943.

The acreage lies between the La Paz area and Mara field, where promising Cretaceous production has been found.

Ecuador Approves Contracts For Shell-Esso Exploration

The Ecuadorean Senate has given its approval to a measure authorizing President Galo Plaza to sign oil concession contracts with Shell Co. of Ecuador and Esso Standard Oil Co., of Ecuador.

The two companies plan to join in oil exploration and development in the eastern regions of Ecuador where Shell has been working for some time. Under the concession proposal, Shell and Standard are authorized to transfer between themselves any of their rights. The measure provides that the two companies spend at least 30 million sucres (about $2,223,000), annually on development, and that a central pipe line be built from any producing fields to a terminal on the Equadorean coast.

American companies in Canada include Husky Refining Co. of Wyoming, which through a Canadian subsidiary, Husky Oil & Refining, Ltd., operates the above 5,000-bbl. capacity refinery at Lloydminster, Alta. The plant, manufacturing fuel and road oils and asphalt products, was placed in operation early this year. Installation of additional facilities, including a complete new distillation unit (left), is now under way

Americans Face Different Operating Procedures in Canadian Exploration

by Neil Williams

International
WORLD-WIDE OIL DEVELOPMENTS

This is the second article of a series on the current exploration activity in Canada by a Journal staff writer who has just returned from an extensive trip in the active area.

Another article, dealing with exchange regulations and the problems of getting funds, equipment, and personnel in and out of Canada will appear in an early issue.

AMERICAN oil companies and drilling contractors in increasing numbers are joining with Canadian operators in expanding exploration and development of Western Canada's extensive oil and gas potentialities. Coming from all sections of the United States, they are finding the way open to participate freely along with Canadians in all phases of operations, including acquisition of exploratory reservations and leases, conducting geophysical and geological surveys, and drilling for and producing oil and gas.

In this, however, they are having to adjust themselves to somewhat different operating conditions and procedures of doing business than those to which they have been accustomed. These arise mainly from (1) the fact that most of the available oil and gas rights are owned by the provincial governments and subject to rather stringent regulations and changing policies affecting leasing and royalty provisions, and (2) the drastic government restrictions, brought on by a shortage of American dollars, against expenditures and transfer of money outside the country.

Mineral Rights Restricted

Ownership of minerals rights by others than the provincial governments is vested only in lands acquired before about the year 1900. Such lands consist chiefly of grants which had been made to a few large land-holding companies, namely: Hudson's Bay Co., Canadian Pacific Railroad, and Calgary & Edmonton Corp. Although extensive and spread widely over western Canada, these grants represent only a relatively small portion of the total acreage and mineral rights still held by the provincial governments. Land acquired by homesteaders and small buyers prior to 1900 also carries with it the mineral rights and is open for whatever lease transactions can be made with the individual owners. However, this land, known as freehold land, is in relatively small tracts in scattered areas and represents only a minor part of the total.

Of the land owned by the above three large holding companies, only that held by the Canadian Pacific Railroad actually is open for leasing and exploratory rights. Most of Hudson's Bay Co. lands are tied up with previous commitments with Continental Oil Co. as a joint owner and with Imperial Oil Co., Ltd., major operator in Canada, having operating rights. Calgary & Edmonton Corp. is interested in active operating companies of its own which naturally have first call on any of that company's lands. This leaves the Crown (government-owned) lands and mineral rights as the chief source of acreage open for acquisition. It is significant to note, however, that in Alberta Province alone, where exploration and development has been largely concentrated, Crown lands and mineral rights comprise more than 147,500,000 acres of the 163,500,000 total acreage embraced.

Administration of Crown lands and mineral rights in Alberta Province is under the direction of the Department of Lands and Mines, of which Hon. N. E. Tanner currently is the minister. Policies followed have been directed toward encouraging individual enterprise and a wholesome competitive system of operation as opposed to government-financed exploration and development. In this every effort has been made to guard against monopoly, encourage the greatest development possible, and insure the public of a "fair share" of the returns from the province's natural resources.

Future Policies Uncertain

Changing policies, particularly as they pertain to higher royalty demands, greater limitations on lease blocks, and more stringent regulations of exploration and development, have created some uncertainties as to possible future attitudes of the government in respect to the status of oil-company rights and their investments. However, assurances have been

given that future changes in policies and requirements will not be retroactive to exploratory reservations and leases already taken, and that the government, looking after the best interests of the public, wants and will continue to want a fair deal for those who take the financial risks of oil exploration.

To facilitate and encourage exploration, Alberta Province has followed a practice of granting exploration permits as "reservations" on large tracts for comparatively small fees. Under present regulations the size of a reservation is limited to an overall area of 100,000 acres, including any acreage owned by others than the government that might be embraced, and having a length not greater than three times its width. The number of reservations which may be held at any time in one name is limited to two. These cannot be transferred or sublet but the holder is permitted to have the exploratory work performed by someone else. Under the latter provision, it is possible, and the practice is prevalent, for companies to have additional reservations taken out in the name of subsidiary companies of individuals whom they can trust, and then perform the exploratory work on them.

A reservation may be obtained by any applicant upon payment of a $250 fee and a deposit of $2,500 for each 20,000 acres or portion thereof to guarantee work being done as required. The deposit is returnable as equivalent sums are spent on exploration up to 50 per cent of the amount expended. The initial period of a reservation is 4 months, during which time the holder must furnish the government a report on the planned exploratory work, either geological, geophysical, or drilling.

If the program is satisfactory, the reservation may be extended an additional 4 months, and if satisfactory exploratory work is continued, it may be extended for successive periods up to a total of a year without further fees or deposits. At end of the first year, it then may be further extended for successive 3-month periods for an additional 2 years' time if satisfactory exploration work is continued. For these renewals, however, a cash fee of 7 cents an acre is required for each of the first two periods, 8 cents an acre each for the third and fourth, 10 cents an acre for the fifth, 15 cents an acre for the sixth, and 25 cents an acre each for the seventh and last.

Leases Are Restricted

At any time during the life of a reservation the holder has the option of converting to lease any part up to 50 per cent of the total Crown acreage embraced. If a commercially productive well is completed, the selection of acreage and conversion to lease must be effected within a period of 90 days from the date of completion, and until this conversion is made no additional wells may be drilled within 4½ miles of the discovery well. A further stipulation is that no more than nine sections (5,760 acres) may be grouped in any one lease block, although it is possible to have additional cornering lease blocks of this size. A strip at least a mile wide around each lease block must be released.

All acreage in a reservation not converted to lease reverts to the Crown for disposal when and on terms prescribed by the government. Such acreage is offered for sale periodically on a sealed-bid basis. In proven or semiproven areas the offerings are made on tracts of approximately 160 acres each. In unproved areas larger tracts may be offered. Any company

International

WORLD-WIDE OIL DEVELOPMENTS

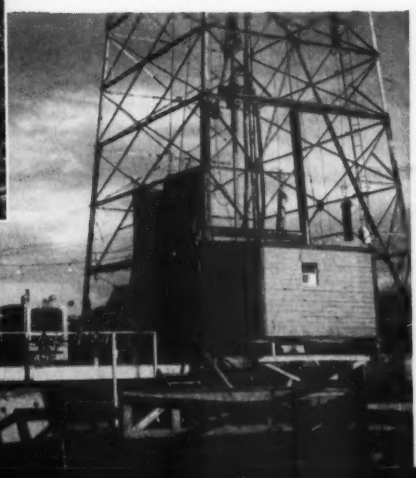
or individual desiring certain tracts may request that such tracts be put up for bidding.

Lease offerings have been made under various conditions, some being placed up for bid on a competitive bonus and fixed royalty basis and others on a fixed bonus and competitive royalty basis. Offerings on the latter basis, however, usually have not met with favor on the part of the operators, and most sales now are made providing an option of a fixed royalty, or fixed sliding-scale royalty based on production.

Royalties Vary

Under the newly adopted Alberta lease form, maximum royalty which may be collected by the government during the 21-year life of a lease will be 16⅔ per cent (one-sixth). Until last April, the government was in a position to increase royalty to any percentage without notice. Actual royalty now collected under a government order expiring in 1951 is a choice between a straight one-eighth and a sliding scale ranging from 5 to 15 per cent based on daily average production.

Lease rental is set at $1.00 an acre per year but expenses in prospecting may be applied against the first year's rental. Upon acquisition of a lease or lease block, drilling must be started within 1 year and continued with reasonable diligence. Upon abandonment of a well, another test must be started within 6 months. Upon completion of a commercially productive well, the next well must be started within 90 days. When a lease or block is proved productive of gas only and there is no available market, development requirements may be suspended (upon approval of the Government) and lease rentals reduced. Leases may be assigned, transferred, or sublet, but only with the written approval of the Minister of the Department of Lands and Mines.



Above: Section of 16-in. loop now being laid by Northwestern Utilities, Ltd., on its gas-transmission system between Viking field and Edmonton, Alta. Right: Typical of drilling equipment in Canada is this rig operated in Leduc field by Can-Tex Drilling Co., headed by Harry Bass, American contractor

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Forecast on Congress

WASHINGTON. — Washington representatives of the major trade associations are probably among the closest observers and keenest analysts of administration policies and trends in congressional thinking. In close touch constantly with key figures in Government and Congress, they know pretty well what is going on and, more important, what is likely to occur.

More than momentary interest, therefore, attaches to their estimates of the effects of the election, the relation between the President and the new Congress, and the course of legislation.

In general, it is believed that President Truman is going to get pretty much what he wants from Congress, at least in the early months of the session. The Republicans, apparently, will come to Washington without a party program, which can't be developed until they see what the President has in mind, and it will be every man for himself; that means that many Republicans will find it expedient to coast with the tide, and for a while it may look like a one-party Congress. Later, of course, they will make tentative thrusts here and there, probing for soft spots on which they can plant a "loyal opposition."

Probably the first rebuff Truman will receive will come from his own party when he asks for reimposition of an excess-profits tax on corporations, as he is expected to early in the session. This will bring him up against Sen. Walter F. George of Georgia, chairman of the finance committee, and Rep. Robert L. Doughton of North Carolina, chairman of the ways and means committee; both are staunch Democrats with long experience in Congress—26 years for George, 38 for Doughton—during which they have developed their own philosophies of what is right in taxes.

Tax Tinkering

Truman's demand for an excess profits tax will not be turned down flatly, but it will be translated into an increase in the regular corporation tax, the extent of which will depend upon the administration's showings of what additional revenue is needed. The President's last statement on that subject was that, on an intake and outgo basis, the Government this year is running $1,500,000,000 in the red, but reportedly neither the joint congressional committee on internal revenue taxation nor the Commerce Department can reach the same conclusion, figuring, on the contrary, that it is in the black in the neighborhood of $1,800,000,000.

The President's program, however, will involve some heavy spending for such things as aid to education, housing, etc., and if there is a surplus it could readily be turned into a deficit.

Except for the excess-profits tax, the observers (they disclaim any pretense at being prognosticators) see the President in a position to put over any program he presents during the first several months of next year, with the one exception of fair employment practices legislation. There, they say, will be a lot of talk but no action, and the members from the southern states have enough strength to defeat any attempt to put over the plan proposed by the Republicans last session to eliminate filibusters in the Senate.

It is generally conceded that all talk of expelling the Dixiecrats from the Democratic party is talk and nothing more. The Democrats have 54 seats in the Senate, and if they oust the members from the four revolting states they will have only 46—and the opposition will have 50. Practical politics, if nothing else, will keep the Dixiecrats in good standing in the upper chamber.

To Check the Planners

CONSIDERABLE concern is being felt in some administration and congressional circles over apparent aims of the National Security Resources Board to turn itself into a peacetime version of the War Production Board which would dominate business and industry.

That concern is expected to be manifested in a sharp curtailment of funds next year which will limit NSRB activities to planning for the next war.

While the board was set up under the National Security Act of 1947 to develop policies and programs for the coordination of military, industrial, and civilian mobilization, it has consistently taken the position that this purpose extended also to planning that would keep industry in a state of readiness for war. It was along the latter line that the much-discussed Pratt report suggested a cutback in domestic production to provide for an underground military oil reserve that would be readily available in the event of war.

The establishment by the board of some 30 "industry divisions" which roughly parallel the War Production Board set-up which, while ostensibly planning groups, could become operational organizations overnight, has focussed attention on the possibilities that the NSRB sees itself as the agency to direct the administration of any inflation or other controls President Truman may ask of Congress next year.

A definite intimation that the board was concerned with the peacetime economy was given by Chairman Arthur M. Hill last January when, in inviting a number of industrial leaders to a meeting in Washington, he said "the implications of the responsibilities of the board under the act are extremely broad, and it is essential that our program be sufficiently comprehensive to cover the total task of mobilizing our entire national resources and keeping them in a state of preparedness to meet any future emergency."

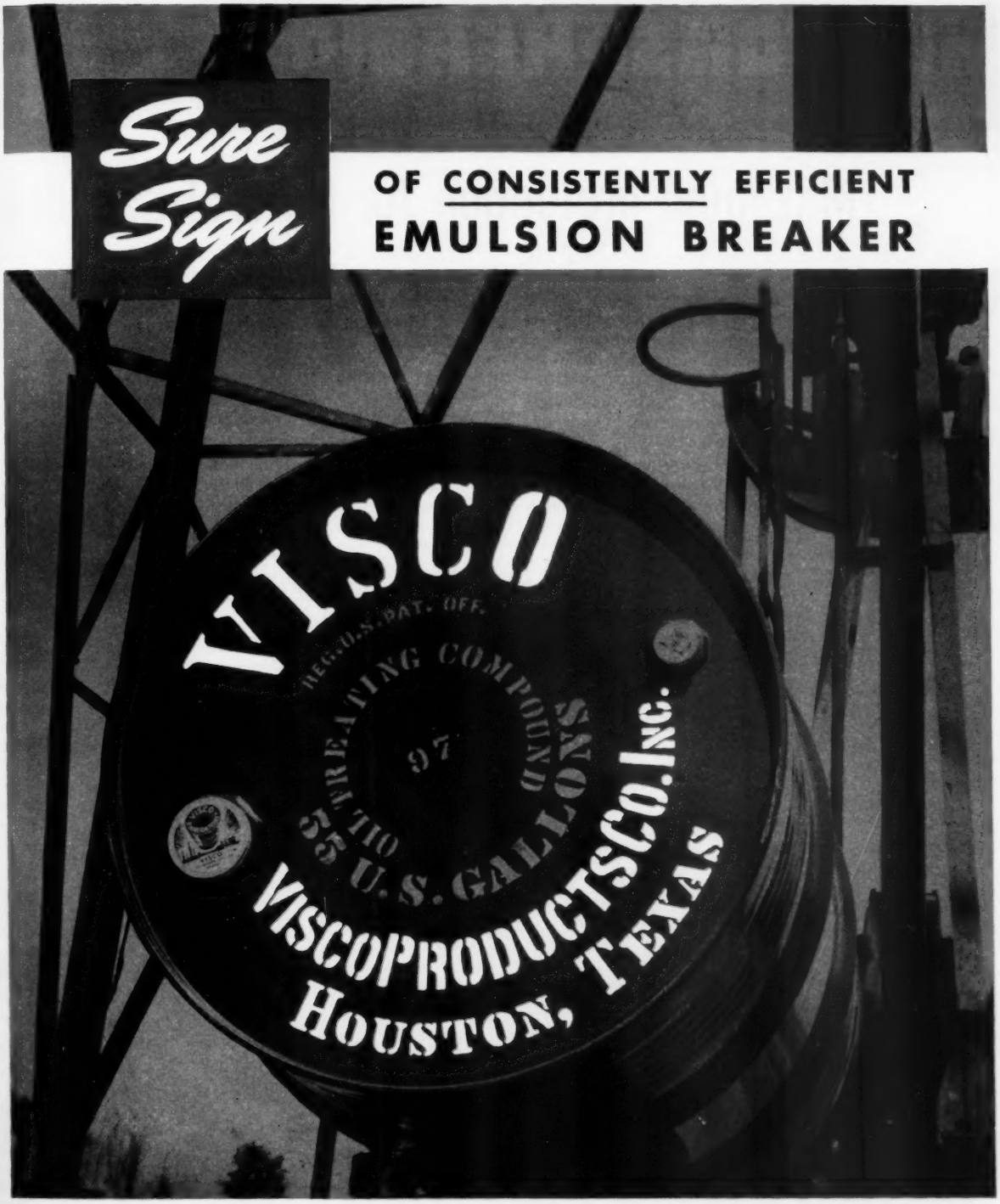
Since the board is represented on the various inter-departmental committees which deal with current problems and policies, it is in a position greatly to influence the thinking of those groups, and thus lay the groundwork for any measures which it deems essential to its objectives.

As the only effective way of purging the board of undesirable activities is through restricting its funds, the appropriations committees of House and Senate are expected to make a careful analysis of its budget next winter, limiting it to the point where the board can do nothing more than the paper work of planning for war.

Small Plums

ECONOMIC COOPERATION ADMINISTRATION records disclose that several hundred United States concerns are sharing in the business developed by the Marshall plan, and that the number is increasing monthly.

During the month of August, alone, 15 companies supplied crude oil and products to the Marshall plan countries. While it is generally thought that the oil business is transacted in stratospheric figures, some of these companies were in on a very small scale indeed, one concern having a single order for lubricating oil that amounted to $1,287.98. On the other end of the scale, of course, there were big orders aggregating, in the case of



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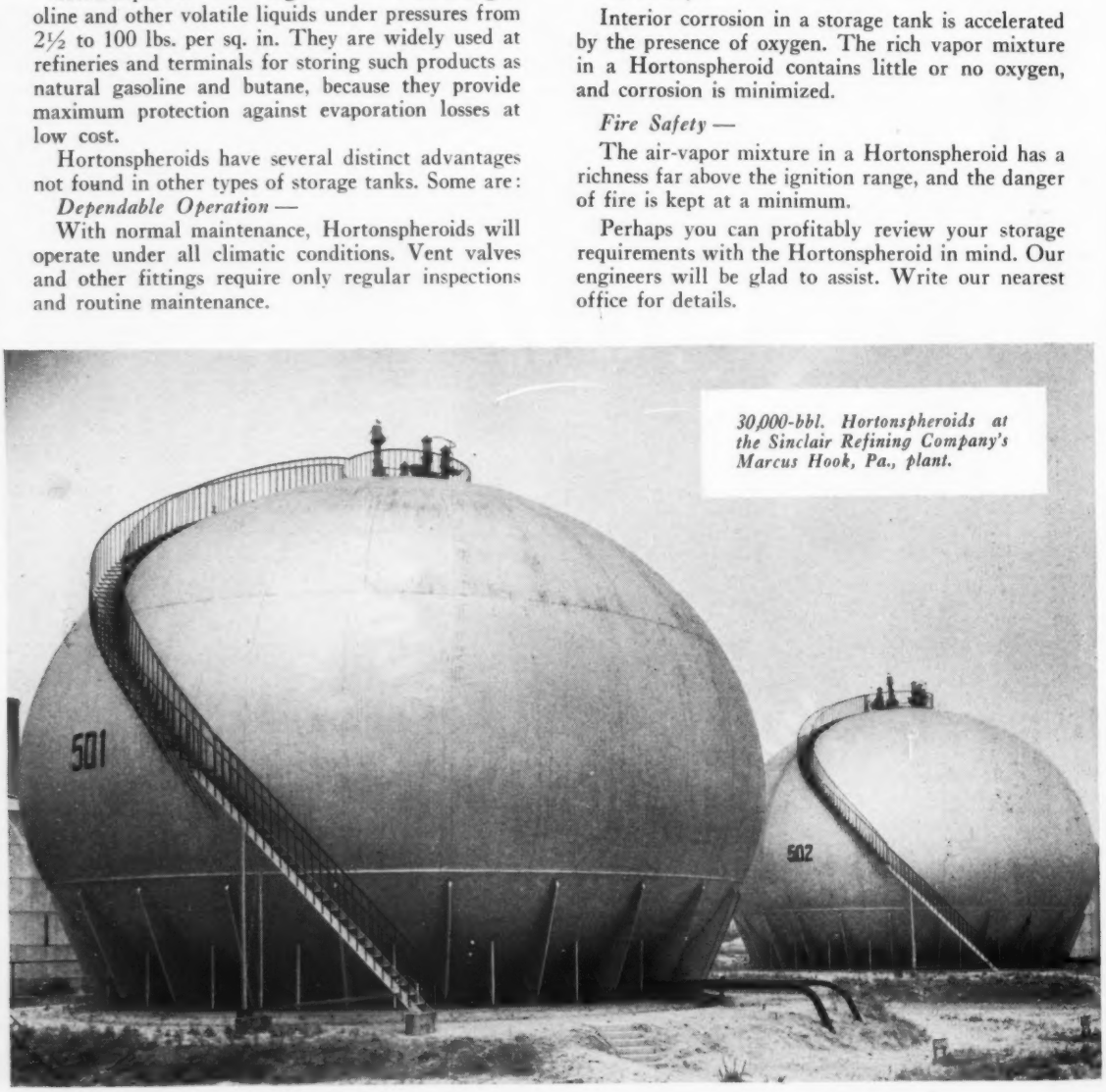
Perhaps you can profitably review your storage requirements with the Hortonspheroid in mind. Our engineers will be glad to assist. Write our nearest office for details.



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Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025-201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 14.....1423 Wm. Fox Bldg.
New York, 6.....3347-165 Broadway Bldg.
Philadelphia, 3.....1615-1700 Walnut Street Bldg.
Salt Lake City, 1.1525 First Security Bank Bldg.
San Francisco, 11..1254-22 Battery Street Bldg.
Seattle, 1.....1325 Stuart Bldg.
Tulsa, 3.....1606 Hunt Bldg.

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Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Compania Tecnica Industrie Petroli, S.A.I., Rome, Italy
Leopoldo Sol & Cia., Reconquista 558, Buenos Aires, Argentina
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Chicago Bridge & Iron Company, Limited, Apartado 1348, Caracas, Venezuela

Esso Export Corp., some $3,700,000 worth of crude oil.

Running down the list of suppliers prepared by ECA, orders are found for Alliance Petroleum Co., Inc., for grease and lubricating and aviation oils; Caltex Oceanic, Ltd., for crude, and Caltex Oil Products Co. for motor gasoline and lubricating oil; Commerce Oil Co. for lubricating oil; Gulf Oil Corp. for crude; Dale W. Moore Oil Co. for crude; Pantepec Oil Co. for crude; Petroleum Export Co., Inc., for cylinder oil; Penn Export Petroleum Division for grease and cylinder and motor oil; Socony-Vacuum Oil Co. for crude; Union Trading Co., Inc., for lubricants; New York Lubricating Oil Co. for lubricating oil; Stendrop Oil Co., for oil, and Sun Oil Co. for compressor oil.

The ECA resume shows that Marshall plan business is being pretty well distributed, with a not inconsiderable part of it going to the little businessmen. While the bulk commodities like oil and cotton are naturally handled by a few large concerns which normally operate on a large-volume basis, there seems to be a pretty good field for companies of all sizes in manufactured products.

Land-Lease Looms

A NEW report on the impact of the European recovery program on the domestic economy is being prepared, apparently to pave the way for adoption by Congress next year of a lend-lease arrangement to help western Europe rebuild its military strength.

The report will be along the lines of that written last winter by the Harriman committee, which provided the foundation for the Marshall plan legislation.

The Harriman report showed that the recovery program would not upset our own economy, and the new survey, which is being made by the same agencies that provided the material for that report, is expected to show what, if any, effects would result from the production and export to Europe of military equipment and supplies, additional to the requirements of the second year of the Marshall plan, which may run 20 per cent under those of this year but will probably bear down considerably heavier on equipment, machinery, and other fabricated articles.

The studies now being made will include a new evaluation of the petroleum situation by the Interior Department, including such factors as what we can expect to produce, how much must be retained here for domestic needs, and what can be exported for the operation of military planes, automotive equipment, etc., in Europe, particularly with respect to such products as aviation gasoline, of which the United States is the only source of volume output.

The whole report is scheduled to be completed in January, so that it can be sent to Congress sufficiently early in the session to permit unhurried consideration.

U. S. Officials Minimize Effect of Basing Point Edict in Senate Hearing

WASHINGTON.—Government officials last week attempted to quiet the fears of industry that the Supreme Court decision outlawing basing point pricing in the cement industry would revolutionize industry pricing systems generally.

Testifying before a Senate committee headed by Senator Homer Capehart of Indiana which is investigating the situation, Federal Trade Commission and Justice Department spokesmen declared industry is placing too broad an interpretation on the decision and pointed out that the court has not passed on the legality of freight absorption but acted merely in a case in which it saw combination and conspiracy to suppress competition and fix prices.

Representatives of a number of industries, however, urged the committee to support legislation which would clarify the situation and, equally important, curb the authority of the Federal Trade Commission so that business may know exactly what it can or cannot do.

"The most disconcerting is the constantly repeated notion that what is to be lawful or unlawful is to be determined not by reasonable clear congressional enactment, but by theories about an economic market which may from time to time occur in the minds of administrative officials," it was explained by John M. Hancock, New York businessman and associate of Bernard M. Baruch.

The hearings are expected to run over a period of several months, with representatives of the oil industry probably testifying sometime in January. The committee will continue to function, despite the election results, with Senator Edwin Johnson of Colorado taking the chairmanship over from Capehart in January. Whether its work will result in any legislation, however, it seen dependent upon the position taken by the administration, which is yet unknown.

Texas Commercial Fishing Suit Delayed to February

HOUSTON.—Federal court trial of a commercial fishing suit of interest to oil operators because of its tidelands connotations has been postponed until early February.

Louisiana residents are challenging the validity of Texas' non-resident commercial fishing boat and fisherman license fees. In particular, the right of agents of the game, fish and oyster commission to enforce these laws beyond the 3-mile limit is being challenged. The Louisiana plaintiffs contend that Texas does not extend beyond 3 miles into the Gulf.

Attorney General Price Daniel announced the postponement of the trial which had originally been scheduled for November 1. Agreement was reached with D. C. Bland, Orange, attorney for the plaintiffs, to postpone the hearings until February. Trial will be held before a three-judge court in Houston rather than in Austin as first planned.

Oil-industry sources do not seem unduly concerned over the case. However, any legal action with tidelands implications will be watched with some interest.

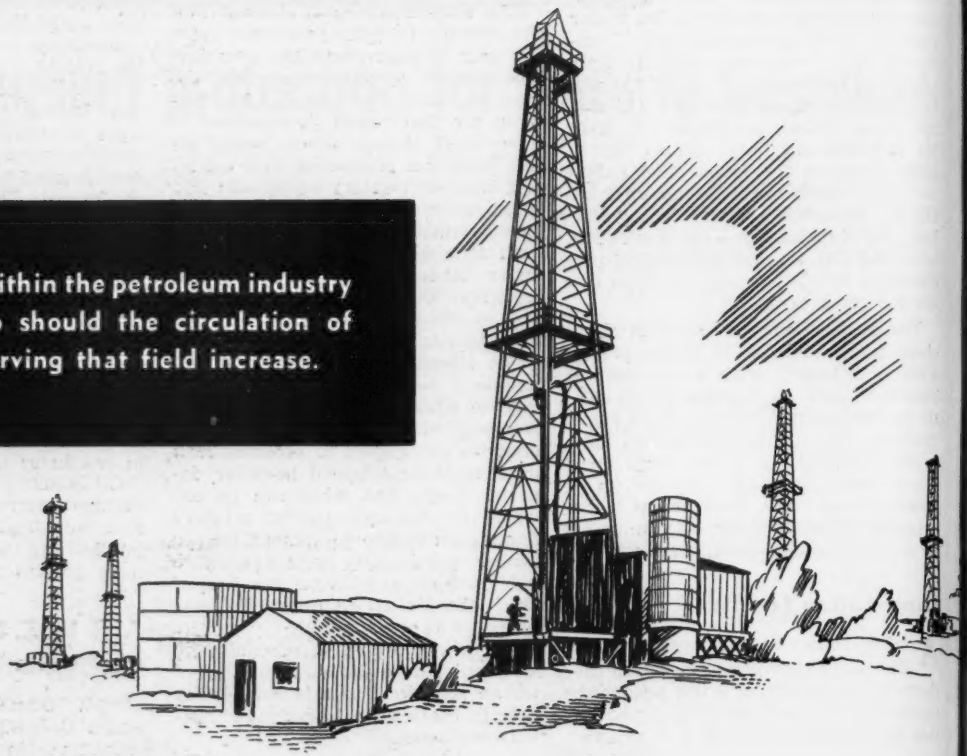
A. S. M. E. Group Hears Talk On Synthetic-Fuel Industry

NEW YORK.—A program under which Government and industry can collaborate in the development of a synthetic-fuel industry using coal and shale was outlined here November 9 by Frank A. Howard, industrial research and development engineer, at a meeting of the metropolitan section of the American Society of Mechanical Engineers.

Howard, former head of Standard Oil Development Co., said more data on coal and shale reserves are required for "an intelligent master plan," and estimated 2 years is needed to design and develop critical equipment for shale retorting and coal gasification. Development of a synthetic-fuel industry, on the basis of national defense considerations, "brooks no delay," he said.

First step in the program discussed by Howard would be a survey of coal and shale reserves supervised by Army engineers under instructions from the Military Petroleum Advisory Committee. Next, complete plans for three coal and three shale projects would be prepared by different industrial groups under contract with Reconstruction Finance Corp. Minimum capacity would be 5,000 bbl. daily with provision for expansion to 25,000 or 30,000 bbl. daily. The third step would be the scheduling of such work against project plans by industrial units now developing processes for shale retorting and coal gasification.

As activity within the petroleum industry increases, so should the circulation of oil papers serving that field increase.



The circulation of a trade paper that is properly serving its reader's needs, will of necessity follow rather closely the growth of the market which it covers. In fact, the manner in which a trade paper follows the expansion within its own field provides a very reliable index as to its acceptance and usefulness within that field.

The accompanying graph tells a simple . . . . but a very convincing story!

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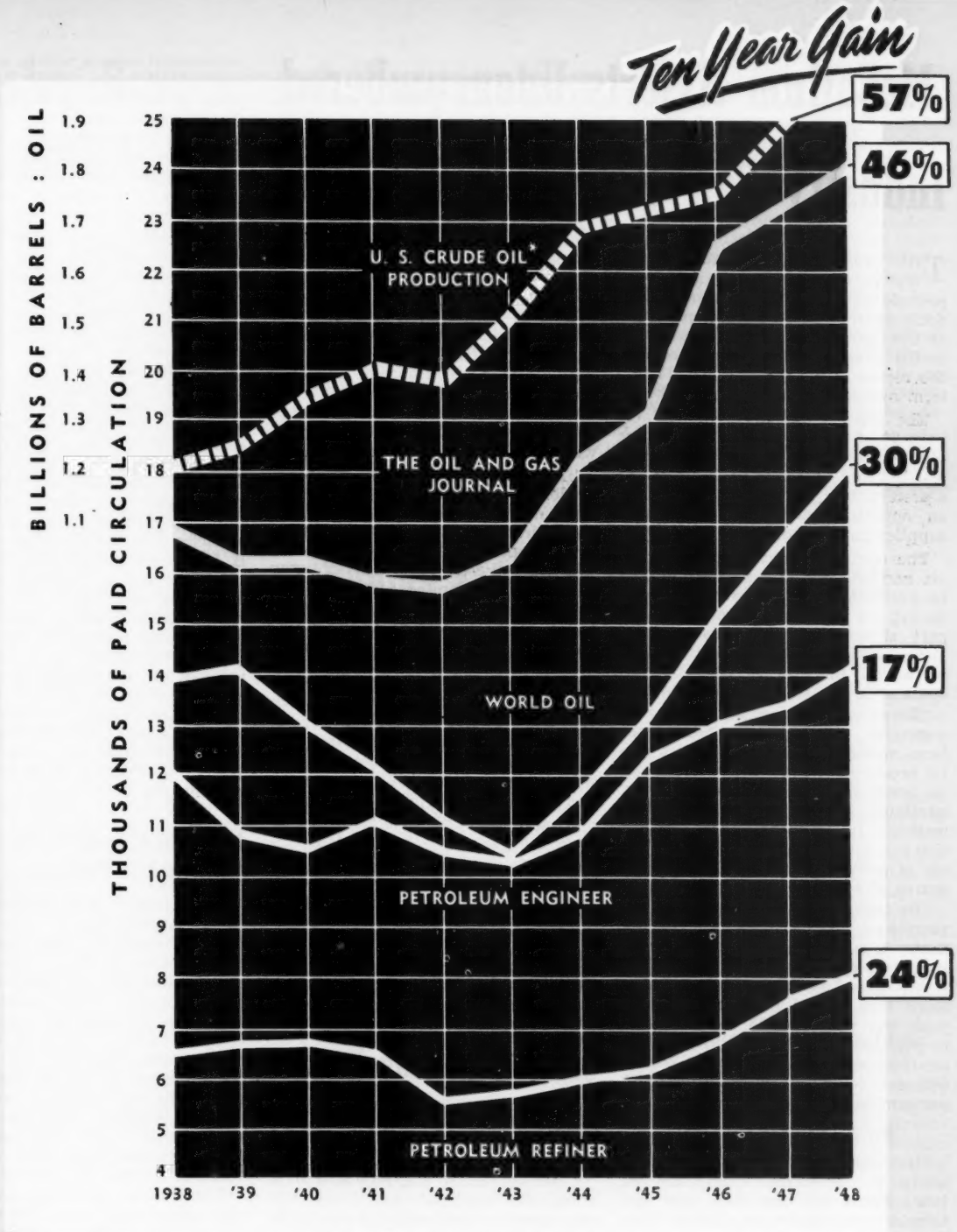


*Crude oil production is the most reliable index for gauging expansion in all phases of the oil industry. As the sustained rate increases, this not only reflects increases in drilling and producing activity, but also means that additional transportation and refining facilities must be provided to keep pace with the increasing production rate.

you follow the Oil Industry!"

McCollum Asserts Unencumbered Industry Can Provide Enough Oil

THE progressive petroleum industry, as it stands today, alone can provide more oil for America, it was declared by L. F. McCollum, president of Continental Oil Co., in presenting to the American Petroleum Institute the report of his committee on long-term availability of petroleum.

The report, published in full on page 70 of this issue, was one of the high spots of the convention, for it was the first time the A.P.I. has made a prediction of this sort and it painted an optimistic picture of increasing supplies during the next 5 years.

The country is not running out of oil, and ample supplies of crude will be available for all foreseeable needs during the next several years, the report showed, but in presenting it McCollum said this will be true only if the oil industry it permitted to operate in its traditional manner.

"There are abundant sources of raw materials within the United States from which petroleum products can be produced synthetically to supply all needs if it becomes necessary or advisable to produce them by this method," he said. "In short, this nation can continue to grow through the use of petroleum products as a major source of energy.

"By 1953, the availability of natural petroleum produced in the United States is estimated to reach an upper range of 7,300,000 bbl. a day. That figure would be 2,300,000 bbl. a day more than actual production in the peak war year of 1945. And, related to population, the availability for all of 1953 would be equal to almost 800 gal. for each person—about 80 per cent higher than it was in 1941.

No Decline for 10 Years

"It is still impossible to foresee definitely the probable trends beyond 1953. From the best data now obtainable, no significant decline from that year's estimated rates is anticipated during the following 5 years.

"However, if a moderate decline in domestic output should be indicated later on, supplementary sources of petroleum and its products are expected to become available in larger volumes if, and when, needed. One of those supplementary sources is made up of our large reserves of natural gas, oil shale, and coal which can be synthesized into liquid fuels."

McCollum blasted predictions that we are running out of oil, quoting some by responsible persons ranging from 1874 to as recently as last winter. He then took up the reasons why developments contradicted the early-day prophets of disaster and why the committee's report refutes current predictions of exhaustion.

"There are two basic answers," he said. "In the first place, the viewers-with-alarm were thinking in static terms. They did not take adequately into account the possibilities of large oil discoveries; neither did they give weight to a dynamic technology.

"The second reason why those predictions went wrong was because they made no allowance for the underlying basic drive of America's system of free, competitive enterprise. The men who made those forecasts did not stop to realize that United States oil producers, operating under a profit system unfettered by government interference, could perform miracles. They ignored the economic truism that those who work hard to forward their own best interests necessarily work also for the good of all the people.

"Intrepid explorers now calmly accept the fact that only one out of five wildcat wells strikes oil.

"Oil men know that the only way to find petroleum is to drill for it. Over the years they have brought in more than 860,000 producing oil wells. They have developed rotary drilling methods which can penetrate below 17,000 ft. They have developed a technique of directional drilling to tap reserves under rivers, hills, and swamps.

(Continued on page 161)

Coast Guard May Assign More Men to Gulf Area

HOUSTON.—The U. S. Coast Guard has appointed a special board to study the need for additional personnel, equipment, and regulations to cope with the expanding tempo of drilling activity in Gulf of Mexico waters.

In addition, the federal department has assigned Capt. Joseph A. Kerrins to the Eighth Coast Guard district at New Orleans as special liaison officer between the coast guard and other federal agencies, state and local governments, and private industry.

In making these two announcements, Adm. Joseph F. Farley, commandant, said, in part:

"Several oil companies have already erected drilling structures in that navigable water area, with many more planned. A large number of commercial vessels will be needed for geophysical exploration to service these drilling units and to transport the oil production.

"From the shipmaster's viewpoint, the oil-drilling structures, erected in the navigable waters, constitute obstructions to navigation which must be adequately lighted and provided with suitable fog warning signals. Regulations dealing with such requirements are in effect. Coast guard facilities will have to be augmented to meet the responsibility of enforcement. Channels through congested regions must be properly bouyed for regular marine traffic.

"It might be logically expected, too, that there will be some increased demand on the assistance and rescue services of the coast guard, particularly during the hurricane season."

The postwar boom in offshore drilling activity has raised many questions concerning many government agencies. Currently, for instance, Col. B. L. Robinson, Galveston district engineer of the U. S. Engineer Corps, is hearing testimony concerning navigation lanes into Galveston Bay and the ports of Galveston and Houston.

Further evidence as to the importance of the subject was furnished by the American Petroleum Institute's program in Chicago last week. At this meeting, a paper entitled "Regulations Covering Drilling Activities in Coastal Waters" was presented by R. G. Watts of Magnolia Petroleum Co.

Morgan City-to-Gulf Channel Is Proposed

HOUSTON. — A resolution urging the construction of a channel from Morgan City, through Atchafalaya Bay, into the Gulf of Mexico to facilitate passage of offshore drilling equipment has been presented to the Louisiana State Mineral Board.

Kerr - McGee Oil Industries, Inc., and Magnolia Petroleum Co., two of the largest offshore operators, maintain their headquarters in Morgan City. In addition, it is reported that several other major companies have under consideration the establishment of marine bases there.

Leo Odom, consulting engineer for the Atchafalaya Basin Ship Channel Association, sponsors of the channel project, appeared before the mineral board. He stated that maintenance of a number of rigs now operating in the Gulf on state-leased tidelands depends upon the facility with which heavy gear can be moved to the drilling locations.

It is understood that the channel would run through marshland areas now under dispute by St. Mary and Terrebonne parishes. Both parishes claim ownership. Some opposition to the proposed channel has developed from persons who fear that it will prove harmful to the trapping industry.

Industry-Government Cooperation Essential, Say A.P.I. Speakers

STRONG pleas for cooperation between the oil industry and the federal Government were made by three of the principal speakers at the closing sessions of the American Petroleum Institute meeting in Chicago last week.

With the background of last winter's congressional investigations and threats of government control, and with the outcome of the recent national election uppermost in all minds, close attention was paid to the observations of Max W. Ball, retiring director of the Oil and Gas Division of the Interior Department; Sen. George W. Malone of Nevada; and Frank M. Porter, president of the Mid-Continent Oil and Gas Association.

And it was no coincidence that all three stressed the need for keeping the facts of oil constantly before the public, the Congress, and the federal agencies, for the theme of the entire A.P.I. meeting was that in this period of social change the oil industry must redouble its efforts to retain public support for its methods of operation.

In a philosophical and historical vein, Ball traced the eternal conflict between liberty and authority and concluded that so far as the oil industry is concerned the problem can be resolved by cooperation between business and government through such activities as the Oil and Gas Division, the National Petroleum Council, and the Military Petroleum Advisory Board.

Malone and Porter Also Speak

Senator Malone, a Republican who headed one of the oil-investigating committees in the current Congress, spoke on "Congress Looks at the Petroleum Industry," and told what the legislators want and need to know about oil. "The Petroleum Industry Looks at Congress" was the topic of Frank Porter, who said he is convinced that the atmosphere for a continued healthy, growing oil industry will be preserved if Congress is guided by facts as submitted by competent authorities and follows its sound judgment instead of listening to those who have axes to grind.

Pointing out that he is about to change from an oil man in government to an oil man active in the industry, Ball said the transition is easy because relations between the government and the industry have become so close that an oil man may feel at home in either.

He explained this by what he called "an adventure in statecraft" — the manner in which, during the war and since, oil men have worked for and with the government in solving mutual problems.

The current world crisis, Ball said, is but another manifestation of the historic struggle between liberty and authority, and he advised oil men to memorize a quotation from 1787: Freedom is necessary to industry. Most of the business is done in the freest states. Industry decreases in proportion to the rigor of government.

To prove this he cited the fact that Russia has petroleum resources as great as the United States but, substituting authority for liberty, it has found and produced only one-tenth as much.

"In our own country, how can we lessen the conflict between authority and liberty?" Ball asked, and answered:

"The answer seems clear. The state is run by men, the men who make the laws and the men who enforce them. We the people, the people who do business in the United States, had better see that we and these men know each other, that we understand each other's needs and each other's objectives. We had better pull together lest we pull apart. Patriotism, the public good, and self-interest demand it.

"I am convinced that cooperation is the present answer to the age-old conflict; that cooperation is the best

(Continued on page 160)

Dunlop Says Inflation Makes High Profits Necessary for Expansion

A VIGOROUS defense of the current level of profits in the oil industry was made before the American Petroleum Institute convention in Chicago last week by Robert G. Dunlop, president of Sun Oil Co., who declared that most of it can be attributed to inflationary forces created by the Government's monetary policy which has cut the value of the dollar in half.

Industry cannot hope to achieve public understanding of its operations as long as people generally mistake the manifestations and results of inflation for its cause, he said.

"Everything else—round after round of increased prices and increased wages and credit expansion—are but the consequences of the increase in the quantity of money that resulted from the monetization of government debt."

"Never in recent years, at least," said Dunlop, "has there been more widespread ignorance and misunderstanding of the function of prices and profits as stimulators of productivity under our competitive enterprise economy than exists today.

"We must correct the widespread popular belief that profits are just a residue paid out to stockholders when a company's books are closed. We must make it clear to all our people that profits have definite jobs to do that are vital to the operation of our competitive economy.

"Profits serve as the most important method of accumulating funds which are needed for new capital investment.

"It is superficial and meaningless to say that 1947 oil-industry dollar profits were approximately 60 per cent greater than in 1946 and that this year's net earnings are running at substantially higher levels.

"To be properly appraised, these earnings must be related not only to the general economic situation, but also to the general oil supply-demand picture, to the volume of sales, to prices, to the purchasing power of the dollar, and finally but most importantly, to the obligations (involving replacement and expansion problems) resting on the industry to supply the oil needs of the consuming public."

Industry Must Have High Profits

Increase in crude prices since the 1941 level where they were frozen by the Office of Price Administration has been less than the increase in all wholesale prices and less than the depreciation of the purchasing power of the dollar, Dunlop said, and was necessary to increase supplies and to overcome the disparity with coal prices caused by government action.

He particularly stressed the point that the oil industry must have high profits to produce the capital needed for essential expansion in all divisions to keep up with the increase in demand, part of which is caused by the inflation, declaring that in the long run a corporate entity must create the capital necessary to effect its generation.

A sharp increase in corporation profits or artificial controls on the industry would stop needed expansion, he said, which would lead to a shortage of supplies, higher prices, and loss of incentives throughout the industry.

Program to Allocate Steel for Oil Industry May Be Revived

WASHINGTON. — Commerce Department officials will make another effort this week to induce the steel industry to write voluntary allocation agreements covering steel for tubular goods and industry and consumer storage facilities, with prospects for success greatly improved as a result of the election.

The steel products advisory committee has been called by Secretary Charles Sawyer to meet November 19 for a discussion of these and other proposed plans which were passed up at the last meeting, October 6.

Following that meeting, Sawyer indicated there was little hope that the efforts of Interior Department officials to push the oil industry's steel program would get anywhere, because of the lengthy procedure and the long "lead-time" required by the steel mills to schedule production, although he did not close the door entirely to further attempts.

For some months the steel producers refused to consider important parts of the oil industry's program, despite bitter criticism by Interior Department officials who charged the steel men either were giving only lip service to the voluntary agreements program or were incapable of running their business so as to meet the country's essential needs.

The election returns, however, brought an abrupt change in the attitude of the steel industry, and representatives indicated they would be glad to reconsider the Government's suggestions.

A major subject of discussion this week will be the continuation beyond next February of the steel allocation programs now in operation. Under an opinion by Atty. Gen. Tom C. Clark, these plans can be maintained in operation for a period of 6 months after expiration of Public Law 395 on February 28, 1949.

While a provision that they might be continued has been incorporated in many of the programs, the steel industry has been drawing a line between Government and civilian plans and, while agreeable to continuation of the former, was less willing to extend the allocation for nongovernmental consumers. One probable reason for the willingness to go along on government agreements is Section 18 of the Selective Service Act, which authorizes the President to place mandatory orders with producers for materials and products required by the Government, which the industry feared might be invoked if it did not act voluntarily.

There are three government programs in effect, covering steel requirements of the Armed Forces, the Atomic Energy Commission and the National Advisory Committee for Aeronautics.

Again as a result of the election verdict, the industry now is seen more willing to keep all the programs in effect, particularly as it is expected the Department of Commerce will recommend that Congress extend the act.

Texas Issues Well Permit To Boy and Girl Scouts

AUSTIN.—Boy and girl scouts of 16 East Texas counties have been granted a permit by the Railroad Commission to drill an oil well in Gregg County. The well is to be the East Texas Boy Scout 1 W. L. Bussey.

The five-acre lease upon which the well is to be drilled has been donated to the East Texas Boy Scout Foundation, Inc., and the East Texas Area Girl Scouts Council. John E. Wrather, Longview, Tex., oil operator and second vice president of the Boy Scouts Foundation Trustees, explained the unusual permit. He said that funds from the foundation will be used to create additional facilities for scouting and also to provide funds in the future if economic conditions make it impossible to maintain the regular financing program for scouting.

A. P. I. Elects New Vice Presidents, Directors

THREE new vice presidents of the American Petroleum Institute were elected by the board of directors at the close of the annual meeting, replacing three who had served two terms of 1 year each and were not eligible for reelection.

They are R. L. Wheelock of Wheelock & Collins, Corsicana, Tex., vice president for production, replacing Jake L. Hamon of Cox & Hamon, Dallas; Chester F. Smith of Standard Oil Co. (N. J.), vice president for refining, replacing Robert E. Wilson of Standard Oil Co. (Ind.), Chicago; and J. Howard Marshall of Ashland Oil & Refining Co., Ashland, Ky., replacing B. L. Majewski of Deep Rock Oil Corp., Chicago.

Other officers reelected were William R. Boyd, Jr., president; W. Alton Jones, Cities Service Co., New York, vice president for transportation; L. S. Wescoat, Pure Oil Co., Chicago, treasurer; and Lacey Walker, secretary and assistant treasurer.

New members elected to the board of directors were Hines H. Baker of Humble Oil & Refining Co., Houston; Rodney S. Durkee of Lane-Wells Co., Los Angeles; Frank L. Herford of Murray Brooks Hardware Co., Shreveport; A. E. Johnson of Argo Oil Corp., Denver; J. A. Lentz of Continental Oil Co., Denver; M. H. Robineau of Frontier Refining Co., Denver; and C. R. Williams of The Chicago Corp., Corpus Christi.

Three new members were elected to the executive committee of the board: T. H. Barton of Lion Oil Co., El Dorado, Ark.; J. C. Donnell, II, of Ohio Oil Co., Findlay, Ohio; and W. T. Holliday of Standard Oil Co. (Ohio), Cleveland.

Next Week

Drilling at 51°.—Procedures and equipment used by Noble Drilling Corp. in a directional-drilling job for The California Co. near Vicksburg, Miss., where maximum angle of 51° was reached to perform the required well deflection.

Bottom-Hole Pressures by Electricity.—New equipment gives surface recording of bottom-hole pressures on drill-stem tests.

Automatic Control of Fractionating Towers.—Refinery-instrumentation engineer discusses typical control systems and suggests a new method for control of precise fractionation.

Prevention of Scale and Delignification in Cooling Towers.—Millions are spent yearly in cleaning and replacing cooling-water systems. This engineering paper discusses problems and points out improvements possible.

Pan American Gas Co.'s New Gas-Regulating Terminal.—At Texas City, this company has a new "nerve center" for handling 200,000,000 cu. ft. of gas daily. Instrumentation in the control room governs pressures, flow rates, temperatures, densities and calorific values, and dispatches gas movements to various systems.

Inhibited Hydrochloric Acid Applications.—"Operating ideas" and practical uses in production, natural-gasoline-plant, and refinery problems.

PERSONALS

Conoco Names Ramsey Refinery Superintendent

J A. RAMSEY, formerly superintendent of Continental Oil Co.'s Wichita Falls, Tex., refinery, has been named superintendent of the company's $9,200,000 refinery now under-construction at Billings, Mont. Announcement of his new position was made in the company's home offices at Ponca City, Okla., by H. G. Osborn, vice president in charge of manufacturing.

His new assignment to the Billings refinery marks a return to the Rocky Mountain region for Ramsey, who served as superintendent of Continental's refinery at Glenrock, Wyo., from 1941 to 1945.

Born in Claremore, Okla., Ramsey began his career with Continental in 1926 as a pipefitter's helper at the Ponca City refinery. In 1935 he was promoted from pressure still foreman to assistant superintendent of the Wichita Falls refinery and in 1941 was transferred to Glenrock. He returned to Wichita Falls as superintendent in 1945.

Ramsey will assist in directing construction of the 6,800-bbl. daily capacity Billings refinery, which is scheduled for completion the latter part of 1949. Contractor for the project is Lummus Co.

J. P. Markey, assistant superintendent of the Wichita Falls, Tex., refinery for Continental Oil Co. since 1941, succeeds **J. A. Ramsey** as superintendent there. Markey, who has been with Continental for 18 years, served as the company's refinery superintendent at Farmington, N. M., prior to his promotion and transfer to Wichita Falls in 1941. **Norman Newton,** resident chemist at Wichita Falls since 1937, succeeds Markey as assistant superintendent, and **Malcom Lider,** formerly assistant resident chemist, succeeds Newton. **M. E. Oliver,** analytical chemist at Ponca City refinery since 1947, succeeds Lider as assistant resident chemist.

W. W. Rogers, assistant general credit manager of Pure Oil Co., has been elected president of the American Petroleum Credit Association at a meeting of the group recently in New Orleans, La. Rogers succeeds **Leo Jones,** Arkansas Fuel Oil Co.

John E. Boulder, formerly in charge of the distribution section of Sun Oil Co.'s western division with headquarters in Detroit, Mich., has been named vice president in charge of the Simrall division for Roosevelt Oil & Refining Corp., Mt. Pleasant, Mich., and also elected to the board of directors of that company. The Simrall division handles the company's crude-oil gathering and procurement activities.

A. C. Long, vice president of California - Texas Oil Co., Ltd., has been appointed assistant to the chairman of the board of The Texas Co. A graduate of the U. S. Naval Academy, Annapolis, Long has been associated with The Texas Co. and affiliates since 1930 except for a period during World War II when he served as petroleum attache for the State Department in London.

H. W. DeYarmett, Shell Oil Co., Inc., has been advanced to senior mechanical engineer, gas and gasoline, and will make his headquarters in Houston. Other Shell transfers include: **G. H. Embry,** drilling foreman, from Corpus Christi, Tex., to Houston; **F. E. Lozo, Jr.,** geologist, from exploration, Houston area, to exploration and production research laboratory, Houston; and **A. M. McLachlin,** exploitation engineer, from Houston to Corpus Christi.

Herman J. Wetegrove, engineer, Texas Railroad Commission, has been transferred from Austin to Corpus Christi to succeed **Harold J. Cook, Jr.,** who has joined Coastal Refineries, Inc., McAllen, Tex.

John T. Jones, who has served with Magnolia Petroleum Co. land offices in Louisiana, Ohio, Illinois, and Texas since 1938, has been placed in charge of the company's land department at Oklahoma City.

Mrs. R. G. Rapp has become president of Denver Producing & Refining Co., to succeed the late R. G. Rapp who was killed recently in an airplane accident. **Stanley Catlett,** attorney for the firm, was elected a director and will devote his full time to company operations.

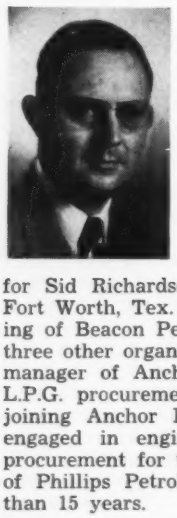
Arthur S. Davenport will resign as assistant to the executive secretary of Interstate Oil Compact Commission effective November 30, and will open a public relations office in Oklahoma City. Davenport joined the commission following his return from military service.

F. J. Swindell, assistant general manager of sales for the central division for Standard Oil Co. (Ind.) with headquarters in the general office at Chicago, has been named to succeed **P. A. Raupagh,** manager of the Detroit, Mich., sales force, who will retire November 25. Other changes of personnel in the department include: **C. E. Quinn,** manager at Joliet, Ill., to succeed Swindell; **P. C. Hawk,** manager of the reseller sales department in the general office, to succeed Quinn; **A. V. Fraser,** assistant manager of the Chicago sales field, to succeed Hawk; and **D. H. Lewis,** sales manager at Mason City, Iowa, to succeed Fraser.

Joe C. Stephens, vice president and manager of the distribution department, Magnolia Petroleum Co., has retired after more than 36 years of continuous service with the company. Announcement was made recently by **J. L. Latimer,** president of Magnolia. **E. L. Upham,** formerly assistant manager of the distribution department and who joined the company 30 years ago as office boy in Dallas, Tex., has been named to succeed Stephens. Stephens, who had served in various capacities in the marketing division for Magnolia, was advanced to vice president in charge of transportation sales in 1931. In 1939 he became vice president and manager of the distribution department.

I. M. Kolthoff, professor of analytical chemistry at the University of Minnesota, has been awarded the William H. Nichols Medal by the New York section of the American Chemical Society for "world leader-

ship in integrating into modern analytical chemistry the pertinent branches of physical science, for . . . training analytical chemists, and for . . . contributions to the theories of solutions, especially interfacial phenomena and electrode reactions."



E. Q. Beckwith, head of Beacon Petroleum Co., Tulsa, recently established marketing firm for natural gasoline, L.P.G., and associated equipment, has been appointed manager of liquefied gas sales for Sid Richardson Gasoline Co. at Fort Worth, Tex. Prior to his founding of Beacon Petroleum along with three other organizers, Beckwith was manager of Anchor Petroleum Co.'s L.P.G. procurement division. Before joining Anchor Beckwith had been engaged in engineering, sales, and procurement for the Philgas division of Phillips Petroleum Co. for more than 15 years.

Frank D. Messenger has been named manufacturer's representative for Pennsylvania Refining Co.'s line of motor oils, greases, gear lubricants, and specialty products.

Joseph W. Butler, president of Butler Oil Corp., Philadelphia, Pa., has been named chairman of the Middle Atlantic Oil Industry Information Committee to succeed **Robert E. Garrett,** Gulf Oil Corp., Philadelphia, Pa.

Andrew Gilmour, geophysicist for Amerada Petroleum Corp., at Tulsa, and **M. M. Slotnick,** geophysicist with Humble Oil & Refining Co., at Houston, Tex., have been nominated candidates for the presidency of the Society of Exploration Geophysicists. Nomination of other executive officers for 1949 include: **Roy L. Lay,** of The Texas Co., Houston, and **George E. Wagoner,** of Carter Oil Co., at Shreveport, vice presidential candidates; **Kenneth E. Burg,** of the staff of Geophysical Service, Inc., at Dallas, Tex., and **Curtis H. Johnson,** geophysicist with General Petroleum Corp., at Los Angeles, nominees for secretary-treasurer; **Richard A. Geyer,** research geophysicist with Humble Oil & Refining Co. at Houston, and **Sigmund Hammer,** geophysicist with Gulf Research & Development Co., at Pittsburgh, Pa., candidates for editor of "Geophysics," the society's journal. Results of the mail ballot will be announced at the society's annual meeting to be held in St. Louis, Mo., in March 1949.

Russell Hogin, of the public relation department of the American Petroleum Institute, has resigned to join a New York firm.

Auston Loyd Benson, tool pusher in southwestern fields of the United States for 25 years, has joined Atlantic Refining Co. as tool pusher in Venezuela.

J. Parks Gwaltney has been reelected chairman of the National Oil Jobbers Council at its quarterly meeting in Chicago.

Leslie A. Brandt, chairman of the Great Lakes Personnel Conference of the American Gas Association and assistant to the vice president and director of employe relations of Peoples Gas Light & Coke Co., Chicago, Ill., has been appointed chairman of the A.G.A. personnel committee.

Paul W. Netterstrom, Rocky Mountain district geologist for Barnsdall Oil Co., has resigned to become engaged in independent geologic research and consulting work in Casper, Wyo.

A. J. Singleton, who joined California-Texas Oil Co., Ltd., in 1947 as assistant vice president when that company acquired the European interests of The Texas Co., has been elected vice president in charge of marketing, West of Suez, for Caltex. At the end of World War II Singleton was appointed assistant general manager of the foreign sales department division for The Texas Co., which position he held when he joined Caltex.

Dr. Wayne E. White, Ozark-Mahoning Co., has been elected chairman of the Tulsa section of the American Chemical Society for 1949. Other officers elected were: **J. L. Burkitt,** Mid-Continent Petroleum Corp., vice president; **Dr. Alfred Steitz, Jr.,** Stanolind Oil and Gas Co., secretary; **Dr. D. D. Hartley,** Mid-Continent Petroleum, treasurer; **Dr. Paul Cardwell,** Dowell Incorporated, councilor; and **R. W. Provine,** Mid-Continent Petroleum, alternate councilor.

Carlos Corcuera, general manager of refining for Petroleos Mexicanos, and **Teodoro Reith,** manager of the northern zone, recently attended the American Petroleum Institute meeting at Chicago, and will remain in the United States to make a study of refining practices.

J. E. Warren, partner, Carl B. King Drilling Co. and former president of American Association of Oil Well Drilling Contractors, and **C. W. Faris** have established a consulting engineering service for the petroleum industry at Midland. Services in valuation, production, reservoir and general development engineering will be offered.

Jack Stackpole, formerly crude-oil scout for Stanolind Oil Purchasing Co., has joined the Midland, Tex., district office of Lion Oil Co. as scout.

J. Harold Perrine, administrative assistant, research and development department, Sun Oil Co., has been elected to the board of trustees of Grove City College, Grove City, Pa.

Kenneth G. Reed, formerly of Dallas, Tex., has joined the land department of Amerada Petroleum Corp. at Oklahoma City.

Conger Reynolds, director of public relations for Standard Oil Co. (Ind.), has been named chairman of the national Oil Industry Information Committee for 1949. Reynolds, a member of the committee since its formation about 2 years ago, succeeds **Ralph C. Champlin,** Ethyl Corp. Four vice chairmen also elected for 1949 include: **Richard Rollins,** Atlantic Refining Co., Philadelphia, Pa.; **George H. Freyermuth,** Standard Oil Co. (N. J.), New York; **G. Stewart Brown,** Standard Oil Co. of California, San Francisco; and **John Clarke,** Lion Oil Co., El Dorado, Ark.

Lee Flood, chief engineer of the Goldsmith Pool Engineering Committee at Midland, Tex., recently announced formation of two companion companies of which he will serve as president and general manager. One organization, Production Management Co. (Promco), is designed to provide a complete, confidential managerial service to the smaller producer. The second firm, Production Specialties Co. (Prosco), will act as a medium through which specialized production equipment and services may be obtained. Flood, who has served as chief engineer for the Goldsmith Engineering Committee in Midland since 1945, will continue in his present position until the end of the year, after which time he may continue to serve the committee in an advisory capacity.

N. B. Winter, district geologist for West Texas district, Midland, Tex., for Atlantic Refining Co., has been named manager of the company's new division organization at Midland which will take the place of the West Texas district. The new organization is scheduled to start functioning as a division group January 1, 1949. **T. C. Frick,** formerly West Texas district superintendent with headquar-

ters at Odessa, will be in charge of operations of the new division. Land activities will be headed by **W. M. Ford**, formerly district landman in Midland. **R. T. Cox**, formerly geologist for the West Texas district at Midland, will head exploration activities in the new division.

F. R. Wheeler has joined the petroleum engineering department of Chemical & Geological Laboratories in Casper, Wyo. Wheeler formerly was petroleum engineer with Engineering Laboratories, Inc., Tulsa.

Stanley D. Breitweiser, formerly of Kansas City, has been named to the newly created position of manager of Continental Oil Co.'s bulk lubricating oil sales with headquarters in Ponca City, Okla. **E. C. Walter**, formerly division manager at Chicago for Continental, has been named to succeed Breitweiser as marketing division manager at Kansas City. Walter is succeeded at Chicago as division manager by **C. D. Carlson**, formerly assistant manager there.

Hugo A. Anderson, vice president of First National Bank of Chicago, has been elected a director of Anderson-Prichard Oil Corp. to fill the position formerly held by L. H. Prichard, Jr.

William A. Evans, Evans Oil Co., has been elected president of the National Oil Marketers Association for 1949 at a recent meeting of the group in Chicago.

SHIFTS—

William R. Cox, Engineer, Shell Oil Co., Inc., Hobbs, N. M., to Odessa, Tex.; **Oliver R. Young**, foreman, Pure Oil Co., Van Horn, Tex., to Forest, Miss.; **Ray Fellows, Jr.**, engineer, Stanolind Oil & Gas Co., Alvin, Tex., to Tulsa; **Walter C. Renton, Jr.**, engineer, Stanolind Oil & Gas Co., Alvin, Tex., to Pittsburgh, Pa.; **W. A. McFadden, Jr.**, superintendent, Standard Oil Co. of Texas, Houston to Midland, Tex.

Wayne R. Bright, engineer, Stanolind Oil & Gas Co., Lubbock, Tex., to Hobbs, N. M.; **O. H. Berry**, engineer, Standard Oil Co. of Texas, Midland to Encino, Tex.; **Harley F. Holliday**, engineer, Standard Oil Co. of Texas, Midland to Kermit, Tex.; **Jim Meacham**, geologist, Humble Oil & Refining Co., Raymondville to Corpus Christi, Tex.; **J. V. Gaudet**, superintendent, Coastwise Petroleum Co., Goodhope, La., to Baltimore, Md.

W. R. Barnew, engineer, Ethyl Corp., Baton Rouge, La., to Dallas, Tex.; **E. J. Owen**, foreman, Stanolind Oil & Gas Co., Lake Charles to Gueydan, La.; **Joseph R. Ault**, engineer, Carter Oil Co., Malvern, Ark., to Port Gibson, Miss.; **J. D. Wheeler**, engineer, Ohio Oil Co., Grand Rapids, Mich., to Midland, Tex.; **W. T. Dabbs**, superintendent, Humble Oil & Refining Co., Columbia, Miss., to Franklin, La.; **Richard R. L. Ward**, engineer, Cities Service Refining Corp., New York to Maplewood, La.

William H. McGuire, geologist, Oil Exploration, Inc., Colorado Springs, Colo., to Pickneyville, Ill.; **B. O. Bird**, superintendent, Phillips Petroleum Co., Rangely, Colo., to Riverton, Wyo.; **Clifford F. Rakestraw**, foreman, Stanolind Oil & Gas Co., Rangely, Colo., to Alcova, Wyo.; **M. J. Cook**, superintendent, General Pipe Line Construction, Great Bend, Kans., to Compton, Calif.

C. T. Johnson, engineer, Core Laboratories, Inc., Escalante, Utah, to Denver, Colo.; **M. R. Hastings**, superintendent, Allison & Hastings, Inc., Worland to Bason, Wyo.; **Frank Winfrey**, engineer, Oklahoma Natural Gas Co., Ada to Wewoka, Okla.; **P. E. Cosper**, foreman, Skelly Oil Co., Lindsay, Okla., to Trinidad, Colo.; **Richard A. Aukerman**, engineer, Shell Oil Co., Inc., Oklahoma City to Great Bend, Kans.; **Claud A. Keller**, superintendent, Sohio Petroleum Co., Oklahoma City to Edmond, Okla.; **Donald W. Hoey**, engineer, Gulf Oil Corp., Seminole, Okla., to Tulsa.

J. O. Jackson, superintendent, Rocky Mountain Drilling, Coalinga to Arvin, Calif.; **John L. Pondern**, geologist, Humble Oil & Refining Co., Brewton, Ala., to Everglades, Fla.; **W. W. Holmes**, engineer, Standard Oil Co. (Ind.), Chicago, Ill., to Beverly Shores, Ind.; **Oliver W. Davis**, superintendent, Cities Service Refining Corp., Maplewood to Sulphur, La.; **Joseph W. Lea**, geologist, Sun Oil Co., Monroe to Shreveport, La.

Straub Roberts, foreman, Danciger Oil & Refining Co., Opelousas to Baton Rouge, La.; **M. A. Stewart**, foreman, Garrett Exploration Co., Magnolia, Ark., to Ranger, Tex.; **L. P. Bristley, Jr.**, geologist, Gulf Research & Development Co., Hazelhurst, Miss., to Monroeville, Ala.; **Joseph Steerman**, foreman, Sinclair Refining Co., Mechanicsburg, Pa., to Marion, Ohio; **Roy B. Bressie**, foreman, Cities Service Gas Co., Pratt to Hutchinson, Kans.; **Hanford Morris**, engineer, The Texas Co., Drumright, Okla., to Tulsa.

DEATHS

George E. Muir, 74, refinery executive and formerly associated with Glade & Muir Oil Works, Crew Levick Co., and Pennsylvania Oil Products Refining Co., died November 6 in Erie, Pa.

Frederick Gere Stodder, 53, independent oil producer, died November 15 in Wichita, Kans. He was a member of the executive board of the Independent Petroleum Association of America.

Howard Maud, 62, retired Texas oil man, died November 12 in Fort Worth.

H. E. Runyan, 59, Sapulpa, Okla., well known for his drilling operations around northeastern Oklahoma, died November 9 near Sapulpa.

Glen V. Douglas, 52, assistant secretary, Bovaird Supply Co., died November 7 in Tulsa.

George W. Simpson, 66, retired oil producer of Bradford, Pa., died November 11 in Buffalo, N. Y.

Victor K. Fischer, lubricating engineer, The Texas Co., died November 14 in Tulsa.

Russell Burton Clark, 48, former accountant for Phillips Petroleum Co. and more recently controller of the Suburban Propane Gas Corp. and the American Petroleum Institute, died recently in West Orange, N. J.

Walter Horace Samuel, second Viscount Bearstead, 66, retired chairman of Shell Transport & Trading Co., Ltd., died November 9 near Banbury, Warwickshire, England.

John E. Tyrell, 48, assistant division manager, Standard Oil Co. (Ohio), Mansfield, Ohio, died November 4 in Cleveland.

F. R. Frederick, 45, Houston, senior exploitation engineer, regional staff, Shell Oil Co., Inc., died October 17 at Port Sulphur, La.

Charles M. Sullivan, 70, pioneer contractor and driller, died November 9 in Winganon, Okla.

William M. Stover, 86, driller in Pennsylvanian oil fields, died November 1 in Franklin, Pa.

Hugh McKeever, 65, retired drilling contractor, died November 9 in San Francisco, Calif.

Report on the Long-Term Availability Of Petroleum

THIS report covers the results of a study of the amount of petroleum which can be expected to be available to this country for all purposes during the 5-year period 1949-1953, inclusive, and a statement covering the supply during the years 1954-1959.

The study shows that petroleum liquids from natural sources will be available within the United States in substantially increasing amounts; that under favorable conditions there will be increasing amounts of petroleum readily available from other areas in both the Western and Eastern Hemispheres for importation into the United States if needed; and that there are abundant sources of raw materials within the United States from which petroleum products can be produced synthetically to supply all needs if it becomes necessary or advisable to produce them by this method. In short, this nation can continue to grow through the use of petroleum products as a major source of energy.

The Study

The study is the most comprehensive undertaken by the oil industry in recent years. It was thorough and painstaking. More than 75 individuals were members of the subcommittee and its various working groups. Each group called upon those geologists and production technicians who had intimate knowledge of the area under study, with the result that several hundred trained personnel participated. Through these individuals and under the procedure followed, it was possible to obtain and consolidate a large portion of the industry's information on this subject.

In estimating future availability of oil for consumption in the United States, both the importance of the subject as well as the inherent difficulties of the undertaking have been recognized. Petroleum, being a natural resource contained in subsurface formations, must be discovered and developed before it can be produced and converted into the many oil products used by the consumer.

The discovery of new underground reserves and the development of these newly discovered fields is the industry's major operation, carried on continuously. It is the most important single factor affecting the estimates of future petroleum availability. The estimates are based on the industry's ever-increasing store of knowledge as to the prospects for further discovery and development but, in the final analysis, the volume of newly discovered and developed oil cannot be determined accurately until the actual results of future drilling become available. It was felt, therefore, that it was both necessary and desirable to show a probable range within which future availability might be expected to fall. With this in mind and subject to the conditions set out in this report, it is believed that this study represents a reasonably reliable guide as to the probable availability of petroleum for consumption in the United States.

Petroleum products for consumption in the United States may be obtained from three principal sources (1) domestically produced crude petroleum and natural-gas liquids; (2) synthetic production from natural gas, oil shale, and coal; and (3) petroleum produced in foreign countries in both the Western and Eastern Hemispheres. All three sources have been considered in this survey, with detailed estimates being shown for the 5 years 1949-1953, inclusive. For the following 5-year period 1954-1958, a more general analysis of probable availability has been made.

THE COMMITTEE

This report, published here in full, was presented by the Subcommittee on Long-Term Availability of the National Oil Policy Committee, American Petroleum Institute, at the twenty-eighth annual A.P.I. meeting, Chicago, November 11. Subcommittee members are as follows: L. F. McCollum, Continental Oil Co., chairman; John R. Suman, Standard Oil Co. (N. J.), vice chairman; Hines H. Baker, Humble Oil & Refining Co.; R. G. Dunlop, Sun Oil Co.; R. G. Follis, Standard Oil Co. of California; Jake L. Hammon, Cox & Hamon, Dallas; B. A. Hardey, Shreveport, La.; John M. Lovejoy, Seaboard Oil Co.; A. C. Mattei, Honolulu Oil Co.; N. C. McGowen, United Gas Co.; R. Ogarrio, Texas Co.; A. W. Peake, Standard Oil Co. (Ind.); S. A. Swensrud, Gulf Oil Corp.; A. E. Watts, Sinclair Oil Corp.; L. S. Wescoat, Pure Oil Co.; Ralph T. Zook, Bradford, Pa.; Minor S. Jameson, Jr., secretary I.P.A.A.

Basic Conditions

The results of the study should be considered in the light of the following basic conditions prevailing: That there will be favorable economic conditions; that there will be no government regulation of, or restrictions upon, the industry's normal activities; that adequate materials will be available to carry on the industry's contemplated operations; that estimated availability will be based on maximum efficient rates of production under engineering principles consonant with good conservation practices; and that there will be no serious interruptions in the industry's activities in the event of war. Any substantial deviation from these conditions in actual developments during the 10-year period, due to matters outside the control of the industry, necessarily would require modification of the forecasted availabilities.

Conclusions

1. It is estimated that total availability of petroleum and petroleum products for consumption in the United States will increase substantially during the 10 years 1949-1958, inclusive.

2. During the 5 years 1949-1953, inclusive, the availability of natural liquid hydrocarbons (crude petroleum and natural-gas liquids) produced in the United States is estimated to increase as shown in the following tabulation:

	Probable range		
	Lower (bbl. dly.)	Upper (bbl. dly.)	Average (bbl. dly.)
1949	6,120,000	6,300,000	6,210,000
1950	6,310,000	6,630,000	6,470,000
1951	6,460,000	6,920,000	6,690,000
1952	6,560,000	7,140,000	6,850,000
1953	6,600,000	7,320,000	6,960,000

For comparison, the actual domestic production of these liquids in 1948 is expected to approximate 5,900,000 bbl. per day (5,500,000 bbl. daily of crude petroleum and 400,000 bbl. daily of natural-gas liquids). The estimated 1953 rates, therefore, would be equivalent to an increase over 1948 of 1,060,000 bbl. daily on the basis of the average estimate of availability.

3. Supplementing the natural petroleum liquids produced in the

United States during the next 5 years the estimated availability of petroleum products from synthetic processes, under foreseeable economic conditions, is relatively small, with the volume reaching approximately 30,000 bbl. daily of oil products converted from natural gas by 1953. However, technically feasible and operable processes for the conversion of natural gas, oil shale, and coal to oil products have been developed, and large sources of supply of those raw materials exist.

4. Production of foreign petroleum is estimated to increase substantially during the 5 years 1949-1953, inclusive. Total estimated production of crude petroleum in the foreign nations of the Western Hemisphere (for use in those foreign nations and for export) is estimated to increase from 1,750,000 bbl. daily in 1948 to 2,490,000 bbl. per day in 1953, and in the Eastern Hemisphere (exclusive of Russia) from 1,500,000 bbl. daily in 1948 to 2,520,000 bbl. per day in 1953. Although it was beyond the scope of the study to estimate future distribution of this foreign oil between consuming areas of the world, these increases in total foreign production should increase the availability from these sources for consumption in the United States. In this connection, it is important to note that consumption within the principal foreign oil-producing countries is relatively small, and the largest part of the output of those countries is available for use in other areas.

5. For the second 5-year period 1954-1958, adequate information on which to base detailed estimates of availability of natural liquid hydrocarbons produced in the United States will not be available for several years. From the best data now obtainable, no significant decline from the 1953 estimated rates is anticipated during following 5 years, but it is impossible to foresee definitely at this time the probable trends. However, as these trends become defined, and if a moderate decline in domestic output of natural liquid hydrocarbons should be indicated, supplementary sources of petroleum and its products are estimated to become available in larger volumes if needed. Large reserves of the raw materials for the synthetic production of oil exist in the form of natural gas, oil shale, and coal. Future availability from these sources may be considered to be limited primarily by the practical considerations of the need for such production and the time, materials, and capital required to construct necessary facilities. Under the conditions set forth in the report, the availability of petroleum produced in foreign countries in both the Western and Eastern Hemispheres is estimated to increase further during the second 5-year period and provide additional supplementary supplies for consumption in the United States if needed.

6. Proved reserves of natural gas are at a relatively high ratio to consumption and, as distribution facilities are expanded, it is estimated that larger quantities of this fuel will be available to supplement liquid petroleum products in supplying the nation's energy requirements.

Estimated Availability of Crude Petroleum and Natural-Gas Liquids Produced in the United States

In estimating the availability of crude petroleum and natural-gas liquids produced in the United States, it was both necessary and desirable to consider a probable range within which this availability may reasonably be expected to fall. Future availability can be measured only to the degree of accuracy that it is possible to measure the results of future operations in the search for, and development of, additional underground sources of supply. Within a limited future period, these results can be approximated. As the period is extended, the margin of error unavoidably increases due to a lack of the information that will later become available so as to permit a significant determination of the volume of oil found and developed. The following tabulations, therefore, show the estimates of future petroleum availability with an upper and lower range. The lower range may be considered as the minimum volume estimated to become available. The upper range represents the probable availability with more favorable results from exploratory and development activities, including unhampered leasing and development of the Continental Shelf. For comparison, figures are included for actual production (not availability) during the preceding 10 years, 1939-1948.

As shown in the foregoing tabulations, the availability of liquid hydrocarbons (crude petroleum and natural-gas liquids) produced in the United States is estimated to increase during the 5-year period 1949-1953. As compared with the 1948 production of crude petroleum and natural-gas liquids of 5,900,000 bbl. daily, the average of the upper and lower range of estimated availability equals 6,960,000 bbl. per day in 1953, an increase of 1,060,000 bbl. daily over the 1948 production. The probable range in availability from this average figure of 6,960,000 bbl. daily varies from a minimum of 6,600,000 bbl. per day in 1953 to an upper figure of 7,320,-

FIVE-YEAR FORECAST OF AVAILABILITY OF U. S. CRUDE OIL AND NATURAL-GAS LIQUIDS

Figures in thousands of barrels (Actual production per U. S. B. of M.)

	Domestic Crude Petroleum	Domestic Natural-Gas Liquids	Total Domestic Crude Petroleum and Natural-Gas Liquids
1939	3,466	*141	3,607
1940	3,697	*153	3,850
1941	3,842	222	4,064
1942	3,799	228	4,027
1943	4,125	240	4,365
1944	4,584	273	4,857
1945	4,695	307	5,002
1946	4,751	316	5,067
1947	5,085	362	5,447
1948 (partly estimated)	5,500	400	5,900

Estimated availability:	Average	Probable range from average: Lower	Upper	Average	Probable range from average: Lower	Upper	Average	Probable range from average: Lower	Upper
1949	5,760	5,670	5,850	450	450	450	6,210	6,120	6,300
1950	5,995	5,840	6,150	475	470	480	6,470	6,310	6,630
1951	6,190	5,970	6,410	500	490	510	6,690	6,460	6,920
1952	6,330	6,050	6,610	520	510	530	6,850	6,560	7,140
1953	6,425	6,080	6,770	535	520	550	6,960	6,600	7,320

*Does not include some cycle condensate included in subsequent years.

000 bbl. daily for that year. The lower range represents an increase of 700,000 bbl. daily during the 5 years over 1948 production, whereas the upper range is equivalent to a 1,420,000-bbl.-per-day increase over the 1948 output.

For the following 5-year period 1954-1958, a lack of adequate information makes it impossible to present detailed estimates. Whether availability from natural sources within this country will be subject to a moderate decline, a maintenance of then existing levels, or a continuing increase after 1953 are questions that cannot be resolved at this time. In this connection, however, the study does not indicate any sharp or substantial decline in the availability of domestically produced crude petroleum and natural-gas liquids during the second 5-year period. Also, in this connection, the availability of petroleum from alternative or supplementary sources of supply, as set out in following sections of this report, must be considered.

Synthetic Petroleum Liquids

For a very long time the oil industry has been looking to synthetic fuels as one means of augmenting the petroleum supply of this country. It is estimated that private industry has already spent in excess of $100,000,000 in the development of synthetic processes. The industry is continuing to spend funds at a rate in excess of $10,000,000 a year and, as increased needs for synthetics should be manifested, far larger amounts would be applied to this field.

Already, processes for the conversion of natural gas, coal, and oil shale to oil products have been developed which are technically feasible and operable. A commercial plant is now under construction to convert natural gas to oil. At the present state of the art, refined products from coal and from oil shale are somewhat more costly than for natural petroleum, but it is possible that continued research and development work over the next decade will lead to processes for producing such products from one or both of these materials as cheaply as from natural petroleum.

The proved gas reserves of the country were estimated at 166 trillion cubic feet at the beginning of this year, whereas production in 1947 was at a rate of only 5.6 trillion cubic feet per year, or a ratio of reserves to production of almost 30 to 1. With this high ratio and with the probability that the reserves will continue to increase for the next few years as they have in the past, it seems reasonable that an increasing volume of gas could be dedicated to the synthetics industry without interfering with other demands for natural gas. The oil-shale reserves are known to be in excess of the equivalent of 100 billion barrels of petroleum. The coal reserves are so great that any estimate of potential synthetics from this source would be too large to be of real significance. There would certainly be adequate coal to supply the oil requirements of this country for many generations to come.

Based on the present plans of the industry and on the basis of present economic conditions, it is estimated that availability from synthetic production during the 5 years 1949-1953, inclusive, will increase to approximately 30,000 bbl. per day by the end of the period. This estimated production will be entirely from conversion of natural gas to oil. During the following 5-year period 1954-1958, it is expected that synthetic production of petroleum products from natural gas will increase at an accelerated rate if needed, supplemented by a relatively small output from plants for the conversion of both oil shale and coal to oil.

In considering the foregoing outlook for synthetics, there is obviously a wide latitude for judgment because of the many conditions that might arise to change the conclusions significantly. Changes in the basic conditions, as set forth previously in this report, would have particularly important effects upon developments in the synthetic field. An additional factor bearing on this situation is the possibility of discovery of unexpectedly large new oil reserves.

Foreign Petroleum

Petroleum produced in foreign countries in both the Western and Eastern Hemispheres provides an additional source of supply for the United States, as a substantial portion of this foreign production has been developed and is being produced by American companies or their affiliates.

The following tabulation shows the total production of crude petroleum in foreign areas (excluding Russia) for the 10-year period 1939-1948 and the estimated production for the 5 years 1949-1953, inclusive:

FOREIGN CRUDE PETROLEUM
Actual Production
(In thousands of barrels daily)

	Western Hemisphere	Eastern Hemisphere*	Total foreign*
1939	914	713	1,627
1940	877	666	1,543
1941	989	584	1,573
1942	727	568	1,295
1943	823	673	1,496
1944	1,067	662	1,729
1945	1,256	719	1,975
1946	1,434	887	2,321
1947	1,592	1,061	2,653
1948†	1,750	1,500	3,250
Estimated Production			
1949	1,900	1,680	3,580
1950	2,060	1,840	3,900
1951	2,250	2,080	4,330
1952	2,450	2,260	4,710
1953	2,490	2,520	5,010

*Exclusive of Russia. †Mid-year estimate.

The foregoing figures do not include a relatively small volume of allied liquid hydrocarbons and synthetic production amounting to approximately 50,000 bbl. daily in 1948 which is estimated to increase to about 70,000 bbl. per day in 1953, approximately one-fourth of which is from the foreign Western Hemisphere and three-fourths from Eastern Hemisphere sources.

With regard to these figures on foreign production, it should be noted that they are total quantities for use in foreign countries as well as supplying the import requirements of the United States. World distribution of these supplies involves questions of estimated oil demands and political considerations beyond the scope of this study. However, certain observations may be made with relation to the availability of this foreign production for consumption in the United States.

Petroleum produced in foreign countries of the Western Hemisphere has been, and is being: (1) consumed in the foreign nations of the Western Hemisphere; (2) exported for consumption in the United States; and (3) exported to Eastern Hemisphere countries to meet that hemisphere's deficiency in oil supply. Petroleum produced in the United States is also being supplied to meet a portion of the deficiency in Eastern Hemisphere output. An increased availability of foreign production for consumption in the United States may be expected as a result of increased Eastern Hemisphere production, making that area no longer dependent upon Western Hemisphere sources. To the extent that this may occur, it will obviously increase the availability of Western Hemisphere oil for use in the United States and other Western Hemisphere nations. In this connection it will be noted that the estimated production in the Eastern Hemisphere (excluding Russia) increases from 1,500,000 bbl. daily in mid-1948 to 2,520,000 bbl. per day in 1953, a rise of approximately 70 per cent in the 5-year period. Foreign Western Hemisphere production is estimated to increase by about 40 per cent during this same period, from 1,750,000 bbl. daily in 1948 to 2,490,000 bbl. per day in 1953. Oil consumption in the principal foreign oil-producing countries is relatively small, with the largest part of the output in these countries being available for export.

For the second 5-year period 1954-1959, foreign production is expected to continue to increase. In view of the large volume of proved reserves, production from Eastern Hemisphere sources may be expected to continue to increase at a faster rate than in the foreign Western Hemisphere.

Natural Gas

In view of the assignment to study the supply of petroleum liquids, no

(Continued on page 161)

Can California Step Up To 1,000,000 Bbl. Per Day And Hold for 5 Years or More?

by C. P. Watson*

IT is my belief that California is capable of producing 1 million barrels per day of liquid petroleum for the next 5 years under favorable economic conditions, availability of adequate material, and under "free enterprise." Beyond the 5-year period any estimate of available supply would be involved with too many uncertainties as to price, new discoveries, and volumes available from Elk Hills and tidelands.

In 1941, the California oil industry was producing an average of about 630,000 bbl. daily. During the war, the California industry steadily increased its production until it reached an all-time monthly production high in May 1945 of 941,000 bbl. per day (one day, in the summer of 1945, the production reached a peak of 980,000 bbl. per day.) This was a monthly increase slightly less than 50 per cent.

To do this during the war, it was necessary to produce for a time, certain wells in excess of the MER—approximately 35,000 bbl. per day. Also, it was necessary to drill new wells at Elk Hills in the Naval Reserve and produce the field at 64,500 bbl. per day—an increase of 57,500 bbl. per day.

Also, it was necessary to ship into California in 1945 by rail, a total of 12,000,000 bbl., and during 1945 withdrew 3,300,000 bbl. from storage.

Thus we found California at the close of the war in August 1945 with a daily average production of approximately 941,000 bbl. The strain of extreme effort was eased immediately. Production in excess of MER was diminished. Elk Hills cut back to 7,000 bbl. per day. Shipments by rail from Texas ceased. But, in September 1945, California's average production was 839,000 bbl., still 36 per cent above the prewar figure of 630,000 bbl. per day.

Heavy Postwar Demand

The California engineers and statisticians immediately set to work estimating the future requirements of the consumer public and military. Some came up with a figure close to the prewar figure of 630,000 bbl. per day; some predicted increases, larger or smaller. But none, as far as I am able to ascertain, estimated the postwar peacetime demand of California to be in excess of the wartime demand.

The factors which were expected to contribute to the increase above prewar demand were as follows:

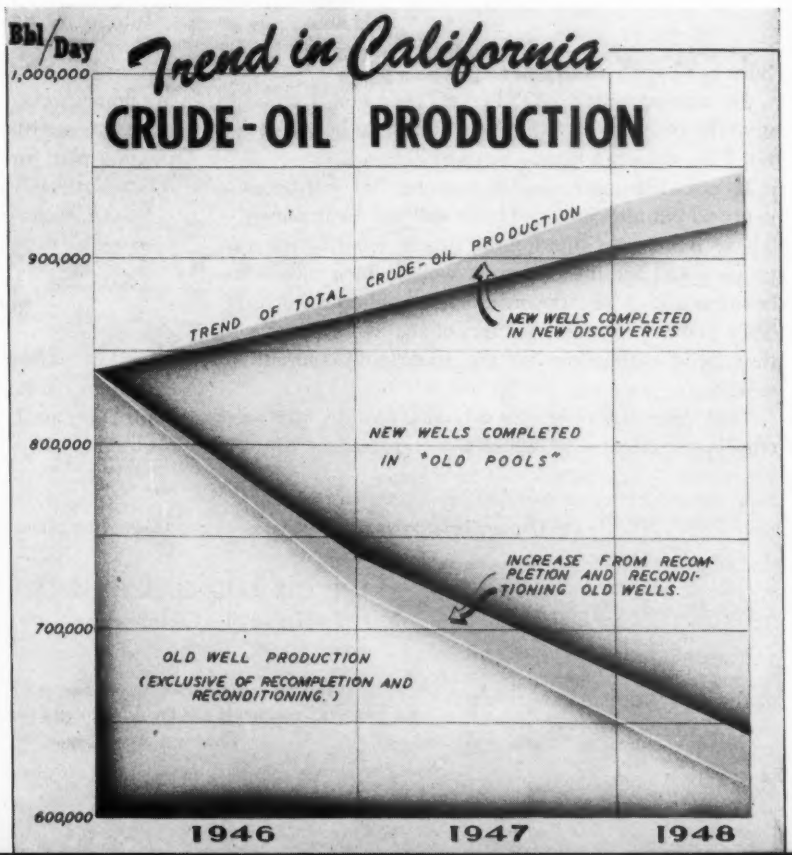
1. Continuing military demands.
2. Increased heavy industrial demand in manufacturing.
3. Increased domestic use because of migration of out-of-state people to California.
4. Increased gasoline use by "vacation starved" Californians.

As factors 1, 2, 3, and 4 continued to function, the peacetime demand continued to increase. To meet that demand the state produced in 1946 an average of 862,000 bbl. per day. In 1947, it produced an average of 913,000 bbl. per day. And in 1948 it has produced an average of 949,000 bbl. per day (6 months), 4½ per cent above the wartime peak and 14 per cent above production of September 1945. The daily production now is over 951,000 bbl. per day.

How has this been done? How is it being done? Since 1939 there have been no discoveries of new major reserves. For some time, we have not even discovered new reserves adequate to replace the gross amount produced and consumed.

The demand has been met by reconditioning and cleaning out existing wells, especially old wells. By putting idle and formerly nonprofitable wells on production. By drilling extensions of old fields, and extending production limits in old leases. By use of improved and expensive pumping equipment. By developing and using improved production techniques. And, by husbanding and aggregating such new reserve deposits as have been discovered.

From January 1, 1945, just before the close of the war, to January 1, 1948, California drilled 4,728 new producing wells, with a footage of 19,377,490; and deepened 434 old wells by an increased depth of 551,934 ft.



*Vice president, Seaboard Oil Co., Los Angeles. From paper, "Postwar Production and Demand," presented at fall meeting of A.I.M.E. Petroleum Division at Los Angeles.

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Purification and Dehydration of Gases

by C. L. Blohm and W. F. Chapin**

THE chemical properties of ethanolamine solutions make them admirably suitable for simple cyclic gas-treating processes. Aqueous solutions may be used for purification of gases, while glycol-amine solutions may be utilized for simultaneous purification and dehydration. While other amines have been and are being used in gas-treating processes, this discussion will be limited to the application of monoethanolamine as typical and most widely employed.

Fig. 1 shows the typical flow of a glycol-amine gas-treating plant. The sour gas is introduced at the bottom of the absorbing column, the contactor. The gas passes up through the bubble trays in the column where it is thoroughly contacted by the glycol-amine solution which enters at the top of the column, while the residue gas, freed of CO_2 and H_2S and dehydrated if desired, leaves the top of the column.

The rich glycol-amine solution, containing the acid gases, leaves the bottom of the contactor and passes through conventional heat exchangers, where heat is exchanged with the hot lean solution; the then heated rich solution is introduced into the regenerating column, the still. The solution passes down through the still where it is heated further and stripped of its acid gas content by contact with the rising vapors in the column; the solution leaving the bottom tray is boiled in a reboiler to provide the stripping vapor.

The overhead steam and acid gas stream from the still passes through a reflux condenser, and the resultant mixture is separated in an accumulator, the acid gases leaving the top of this vessel and the water condensate being pumped to the top of the still as reflux. The regenerated lean glycol-amine solution leaves the bottom of the still, passes through the exchangers and is pumped through coolers back to the top of the contactor, thus completing the cycle.

It should be pointed out that, although the contactor, still, and auxiliary equipment employed are conventional, the process involves chemical reaction and not physical absorption. This fact results in low equilibrium vapor pressures, so that few equilibrium contacts are required. However, attainable purity of treated gas with regard to H_2S, is controlled by one of two variables, i.e., first, the contactor efficiency and second, the equilibrium vapor pressure at the top of the contactor must be less than that determined by the purity requirement. In regard to the latter, it is obvious that the minimum H_2S vapor pressure at the top of the contactor is fixed by the H_2S content of the lean solution, and is controlled, therefore, by the effectiveness of the stripping operation.

As shown on the flow sheet, the steam to the reboiler is controlled by the temperature in the reboiler, while the reflux to the still is flow controlled, either manually or automatically. This method of control proves satisfactory, as a small change in the water content of the solution results in a significant temperature change in the boiling point of the solution. This is illustrated in Fig. 2, which shows the vapor pressure of diethylene glycol solutions plotted against temperature. Although the presence of monoethanolamine changes the actual temperatures somewhat, it readily may be seen that temperature is the most satisfactory variable to use in controlling the composition of the solution.

The typical flow scheme for an aqueous amine plant is the same as that shown for a glycol-amine plant, the only difference being that the steam to the reboiler is flow controlled, while the reflux is controlled by a level controller on the reflux accumulator. In this case the boiling-point temperature change with a change in composition is not sufficiently sensitive for the use as a control variable. This fact is also shown in Fig. 2 by the lines showing the change in vapor pressure of aqueous monoethanolamine solutions with temperature.

The prime difference between the use of an aqueous amine solution and a glycol-amine solution, other than the dehydrating effect of the latter, lies in the mechanism of regenerating the solution. Since the absorption of H_2S and CO_2 in monoethanolamine solutions involves a chemical reaction, regeneration of the solution involves a reversal of this reaction.

As mentioned above, the maximum purity obtainable on any gas being treated is a function of the pressure and temperature at the top of the acid gas absorption column and the amount of the acid gases remaining in the stripped lean solution. Any H_2S or CO_2 remaining in the solution will exert a certain vapor pressure at the top of the absorber, with an amount of H_2S and CO_2 equivalent to this vapor pressure being the minimum that can leave the top of the column in the treated gas. Thus, the degree of regeneration or stripping of the solution obtained in the regenerating column will determine the maximum purity or the minimum possible content of H_2S and CO_2 in the treated gas leaving the top of the absorber.

Normally an increase in pressure is detrimental to any stripping operation; however, an increase in pressure with a corresponding increase in the boiling point of an aqueous mono-

*The Fluor Corp. This paper, presented earlier this year at California Natural Gasoline Association meeting, has just been made available for publication. The introductory section dealing with the historical phases of lime and iron-oxide treating processes is omitted.

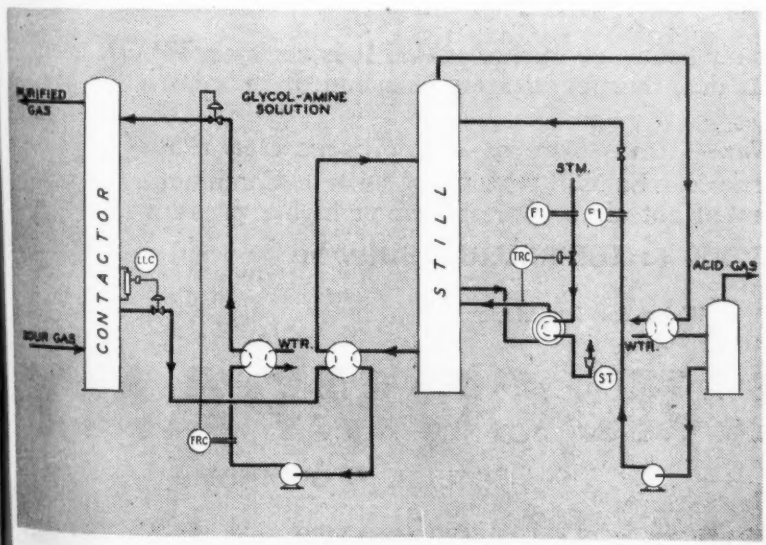

Fig. 1—Typical flow diagram of glycol-amine gas-treating process

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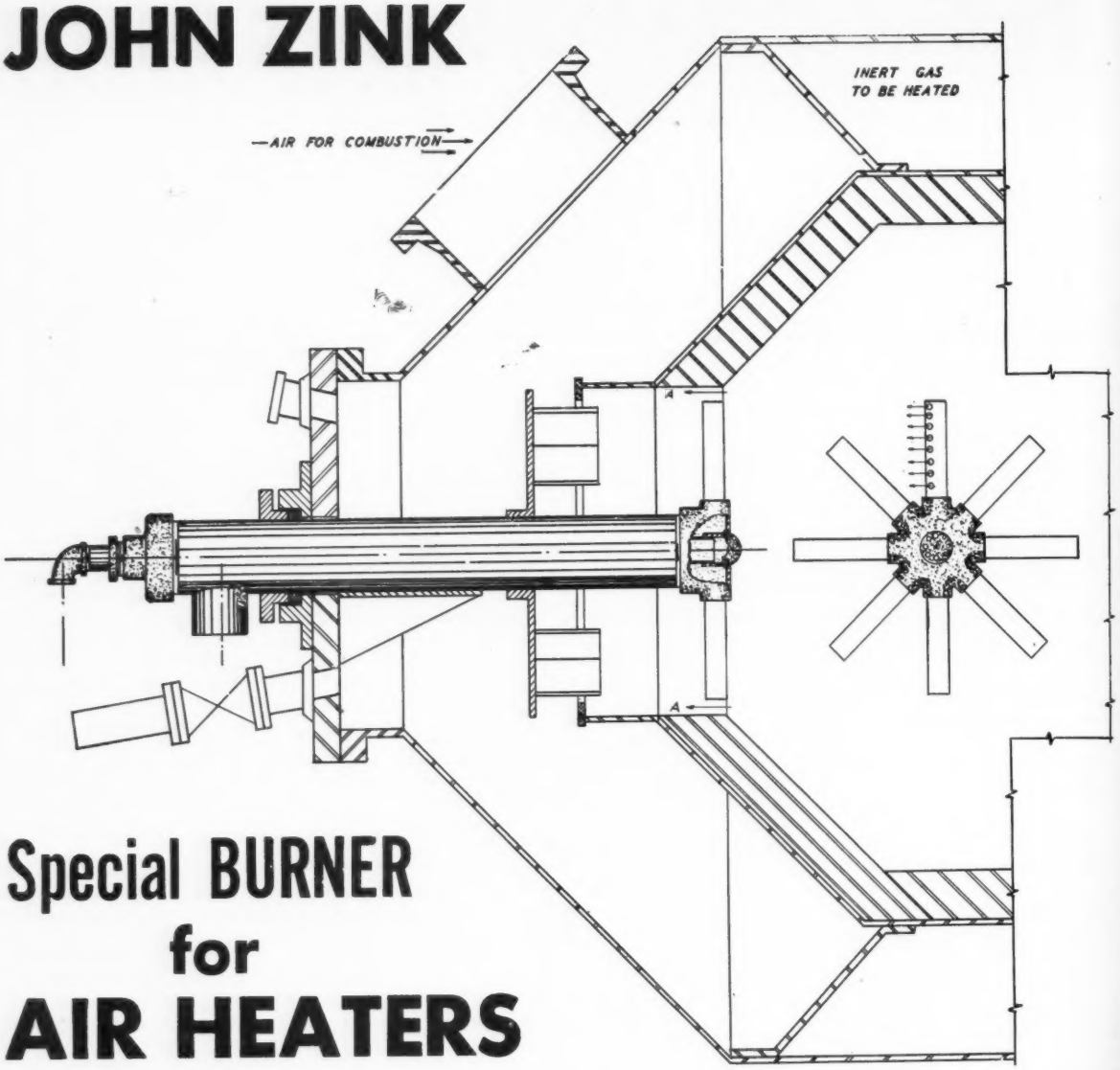

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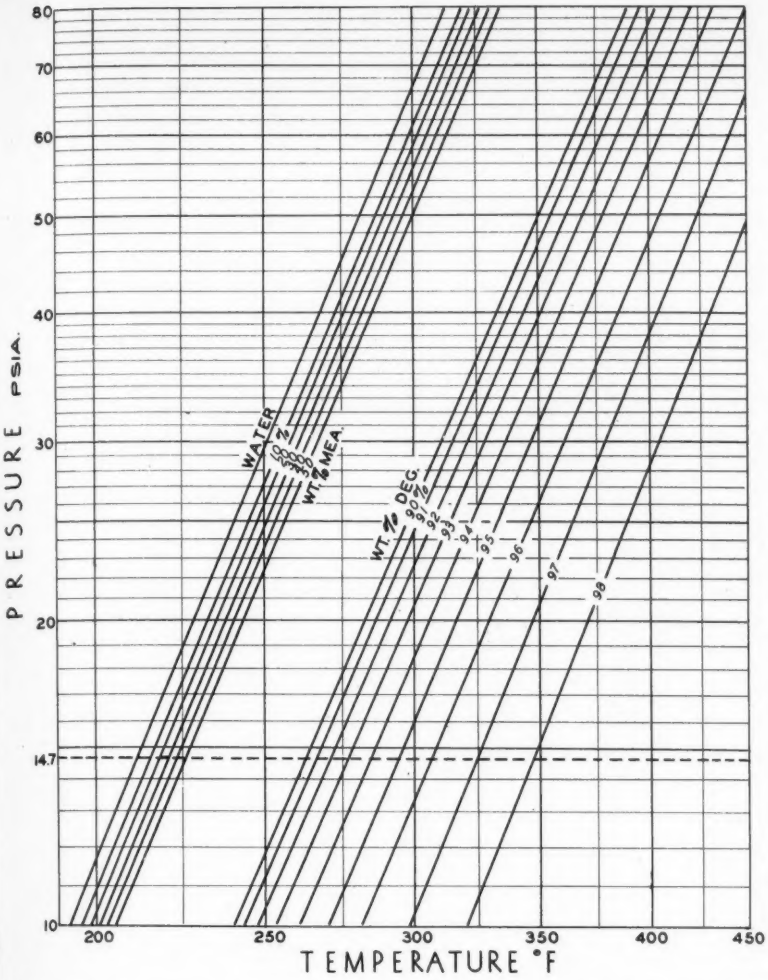

Fig. 2—Vapor pressures of aqueous solutions of diethylene glycol and monoethylene glycol amine

ethanolamine solution permits more complete regeneration of the solution as far as CO_2 is concerned. This phenomenon results from the fact that dissociation of the monoethanolamine-carbon dioxide complex, which is by no means complete at the atmospheric pressure boiling point of the solution, increases rapidly enough with temperature to overcome the adverse effects of the increased pressure on the stripping. On the other hand, this is not the case with H_2S and an aqueous monoethanolamine solution. The monoethanolamine sulfide is substantially dissociated at essentially the atmospheric pressure boiling point of the solution. Thus, the benefits of increased temperature are not sufficient to overcome the adversities of the increased pressure, and the stripping of H_2S is hindered at elevated pressures. Therefore, when pressure regeneration is used for aqueous monoethanolamine solutions, with the regenerating column maintained under pressure ranging up to 50 psig., the total amount of acid gas remaining in the stripped lean solution is markedly reduced in cases where there is an appreciable ratio of CO_2 to H_2S in the rich solution. Nevertheless, although the actual quantity of H_2S remaining in the solution is less than that of CO_2, the H_2S content may actually increase with increasing regeneration pressure. In general, however, the net result of pressure regeneration is a decrease in total acid gas content of the stripped solution.

In contrast to the above, the use of a glycol-amine solution raises the regeneration temperature without pressure increase, and further, the presence of the glycol has a beneficial effect in the stripping equilibrium. Consequently, the adverse effects of pressure regeneration are not encountered, and both H_2S and CO_2 can be stripped essentially completely. This feature constitutes one of the most important advantages of the glycol-amine system.

Reduced Utility Consumption

A two-stream flow cycle may be used in case of an aqueous amine solution which will reduce utility consumption to a point more comparable to that of a glycol-amine solution. This arrangement is shown in Fig. 3. The rich solution from the bottom of the absorber is split into two streams, half going to the top of the still and half to the middle.

Just above the point at which the middle stream is introduced to the column, the stream to the top section is drawn out, and then flows to the reboiler. This upper stream, which would not be regenerated to the same degree as that in a normal single-stream plant, then flows through exchangers and coolers to the absorber, where it enters several trays down from the top.

The vapors from the reboiler rise from the bottom of the still contacting the downflowing solution which was introduced in the middle of the column. Although the actual quantity of vapor rising in the column is less than for a normal single-stream

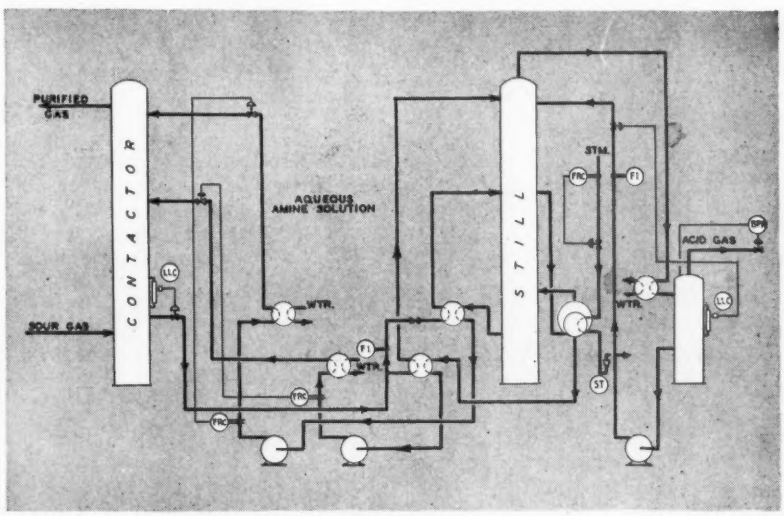

Fig. 3—Aqueous amine split-stream cycle

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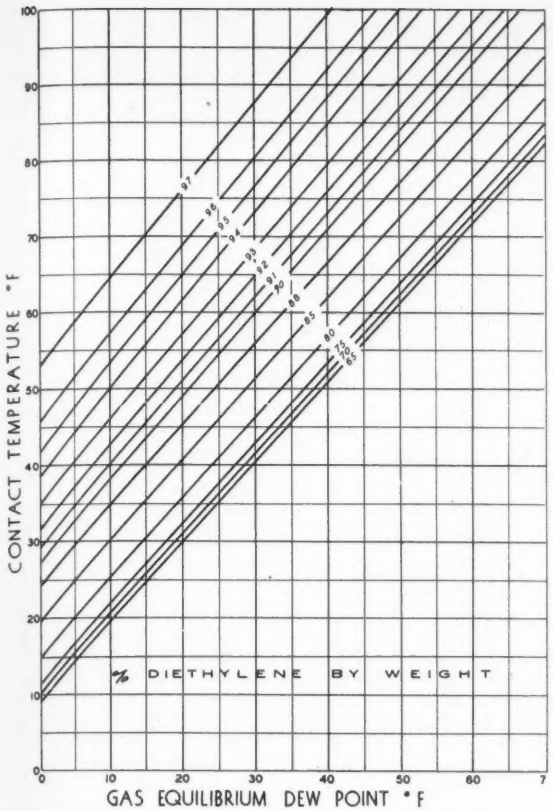

Fig. 4—Gas dehydration diethylene glycol-water solutions

plant, it is contacting only half the volume of liquid flow, so the solution leaving the bottom of the still is then more completely stripped of acid gases than that of a single stream plant. This stream is then introduced into the absorber on the top tray.

This two-stream principle, employing a "lean" and a "very lean" solution, has been used in several gas-treating processes, such as Shell Oil Co., Inc.'s tripotassium phosphate process, and was first disclosed by Shoeld[1]. Although this two-stream application of an aqueous amine solution saves utilities, the initial cost of the treating plant itself is increased. The still itself obviously has a higher cost as more trays are required, and the two streams require two piping systems with two sets of exchangers and coolers.

It then becomes obvious that higher purities are obtainable by the use of a glycol-amine solution than by an aqueous monoethanolamine solution inasmuch as the glycol-amine solution may be stripped much more completely of the absorbed acid gases. This is particularly important when considering the cases where extremely low H_2S quantities are specified for treated gas. A difference of but a few grains of H_2S remaining in the regenerated solution can mean the difference in meeting or not meeting a specified gas purity.

As previously mentioned, the glycol-amine process was originally developed to accomplish simultaneous acid gas removal and dehydration of a natural-gas stream. It was found in the earliest application that a glycol-amine solution with the same water content as a diethylene glycol solution will dehydrate the gas to slightly greater degree than the latter.

Fig. 4 shows the dew-points obtainable with various concentrations of diethylene glycol solutions at various contact temperatures. Although glycol-amine solutions give slightly better dehydration, this same chart may be used for estimating attainable dew points with such solutions. Dew-point depressions of 50° F., i.e., the water dew point of the purified and dehydrated gas is 50° F. less than the contactor outlet temperature of the gas, may be reached economically by use of glycol-amine solution.

In the above discussion of dehydration, the term "dew point" is used, since this terminology is common in the industry. However, reference to dew point of effluent gases from liquid dehydraters has no significance when used to evaluate the water content of such gases. The gas leaving the top of a contactor has approached equilibrium with the solution on the top tray at the temperature and pressure conditions existing, so that any decrease in temperature will result in condensation of liquid from this gas, the composition of which will be approximately the same as that of the top-tray liquid.

On the other hand, effluent gas from a solid-bed, nonvolatile dehydration will contain only water, so that then a dew-point measurement is a true indication of water content. It is obvious, therefore, that in liquid-dehydration systems, the precise terminology should employ absolute water content determined by other than dew-point measurements, which give completely erroneous results, the value obtained being a function solely of the operator and means of procedure.

In this connection, it should be pointed out that dehydration of transmission gas is employed principally to prevent possible hydrate formation, and, since the gas from glycol-amine plants contains small amounts of these chemicals, the actual hydrate formation point can be suppressed below that corresponding to the water content of the gas alone. This effect offers some advantage in either glycol or glycolamine dehydration, the advantage being greater in the latter case.

One important factor to consider in the design of a glycol-amine plant is the temperature approach at the top of the contactor between the outlet gas and the inlet lean solution. The heats of reaction of H_2S and CO_2 with monoethanolamine are considerable, and in an improperly designed plant can cause the outlet temperature of the gas to be sufficiently high to interfere with proper dehydration. The dew-point depression would be normal, but the outlet temperature of the gas might be 100° F. instead of a desired temperature of 80° F., causing almost a corresponding increase in the dew point.

The combination glycol-amine solution for simultaneous purification and dehydration may not always be the best answer where both results are desired, the most economical choice being dependent on many factors. In many cases, particularly where the treating requirements are not rigid, a purification plant using an aqueous amine solution followed by a separate dehydration plant utilizing a straight diethylene glycol solution might prove to be the most attractive answer.

Two-Stage Cycles

The glycol-amine process also lends itself readily to two-stage cycles, wherein the gas is treated and partially dehydrated in the first stage and dehydrated in the second stage. The cycles are particularly applicable where it is desired to treat the gas at a certain pressure prior to compressing the gas for transmisison, with the dehydration step taking place at the final presure.

One such scheme circulates a glycol-amine solution containing 15 to 25 per cent water in the equipment shown in Fig. 5, with the principal lean solution stream entering the contactor a few trays down from the top. A small side stream is taken from the reboiler to a smaller reboiler, wherein it is concentrated to about 5 per cent water. This small stream, after being cooled, is then introduced to the top tray of the contactor. As mentioned in the preceding paragraph, the top few trays of this contactor could actually be another small contactor operating at higher pressure.

Another cycle that may be employed has been described by McCartney[2] and is shown in Fig. 6. As above, the main solution treating stream might be glycol-amine solution containing 15 to 20 per cent

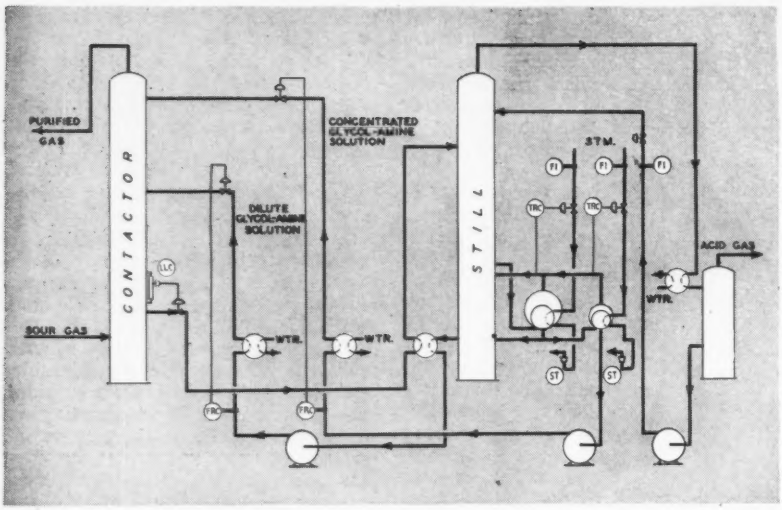

Fig. 5—Glycol-amine commingled two-stream cycle

water. In this case the small concentrated stream is kept separate from the more dilute treating stream by a chimney tray in the contactor, and passes through its own small exchangers, coolers, and reboiler, the vapors from the latter being discharged into the main treating section still. This cycle has an added advantage of substantially reducing vaporized amine losses from the plant. The monoethanolamine builds up to a certain extent in the concentrated solution, but most of it is vaporized in the small reboiler and returned to the main treating solution in the still. Again, the top section of the contactor should be a separate vessel operating at a higher pressure.

The use of a dilute glycol-amine solution in such cases has distinct economic benefits. For simultaneous treating and dehydration a glycol-amine solution containing approximately 5 per cent water is used, but, where the job may be done more economically in two steps, or where purification only is desired, the more dilute solution may be used to advantage. The treating requirements set the tolerable amount of acid gas remaining in the lean solution, which then sets the required regeneration temperature, and this in turn sets the water content of the solution. The more dilute glycol-amine solution then has a lower viscosity which results in higher heat-transfer rates. The regeneration temperature is less than that of the concentrated solution, thus reducing the heat load on the exchangers and decreasing the reboiler surface by increasing the mean temperature difference between the solution and the heating steam, or, if desired, permitting the use of lower pressure steam.

Typical solution compositions employed in the glycol-amine process may be comprised of from 10 to 30 per cent monoethanolamine, 45 to 85 per cent diethylene glycol, and 5 to 25 per cent water. High purities can be reached economically by using glycol-amine solutions containing less water than indicated above.

No generalization can be made as to the most economical selection of one of the amine-type processes to accomplish purification of a gas stream, or to obtain both purification and dehydration. However, an aqueous monoethanolamine solution can usually be used to advantage where the specifications for the treated residue gas are not stringent. This is particularly true of cases where the prime emphasis is on recovering CO_2 or H_2S for further use rather than on the purity of the treated gas.

But the advantages of the glycol-amine process become more prominent as the treating requirements become more rigid, principally because of the fact that glycol-amine solution may be stripped so completely and so readily of CO_2 and H_2S especially the latter. However, as is always the case in comparison of two processes, advantages are associated with some disadvantages. A glycol-amine solution is subject to lower heat-transfer rates than an aqueous amine solution because of its higher viscosity, necessitating more heat-transfer surface, and the cost of the initial charge of diethylene glycol for the plant solution may prove to be a sizable item, even though the operating losses of this constitutent are normally negligible.

Two-Stream Arrangement

On the other hand, with an aqueous amine solution it is necessary to go to a more complicated two-stream arrangement to meet some purity requirements and to save in operating utilities, necessitating additional equipment, and some purity specifications cannot be met economically by such a device.

Where dehydration is also required, the same comments apply as for the purification only, and the choice is further complicated by the fact that more alternate schemes are available to accomplish the desired results. Separate plants, dilute and concentrated glycol-amine streams or a concentrated glycol-amine stream with a low water content to obtain the results simultaneously might be the best answer. The choice would be dependent largely on the purity required in the treated gas and on the size of the required treating plant. However, if the necessary treating plant size is small, it is obviously most economical to obtain both results simultaneously, rather than use separate plants or separate streams, one for purification and one for dehyration.

The initial investment and operat-

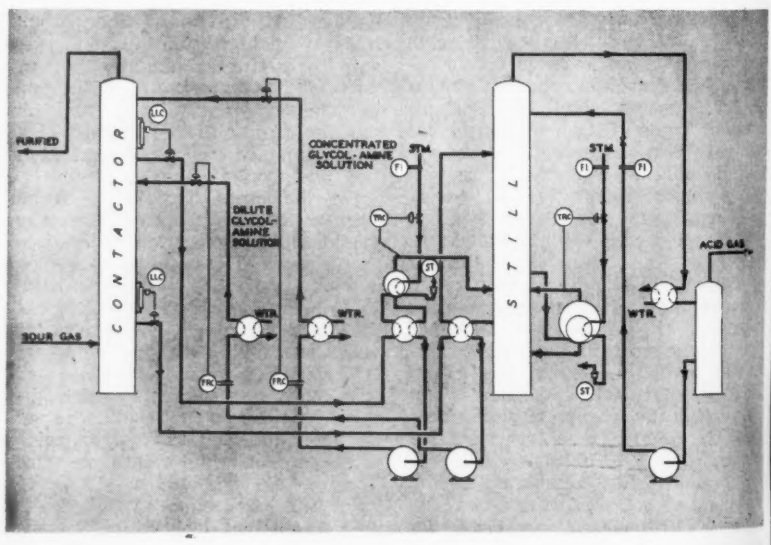

Fig. 6—Glycol-amine separated two-stream cycle

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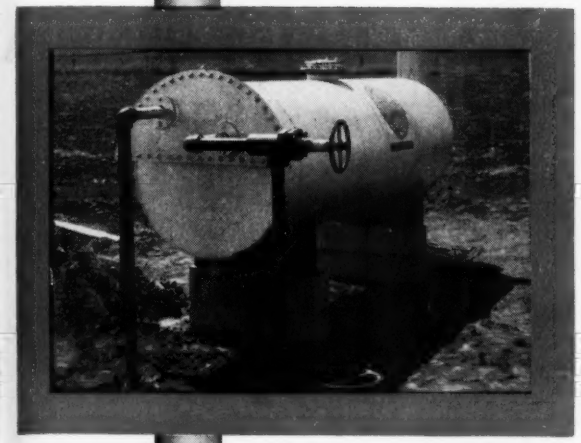

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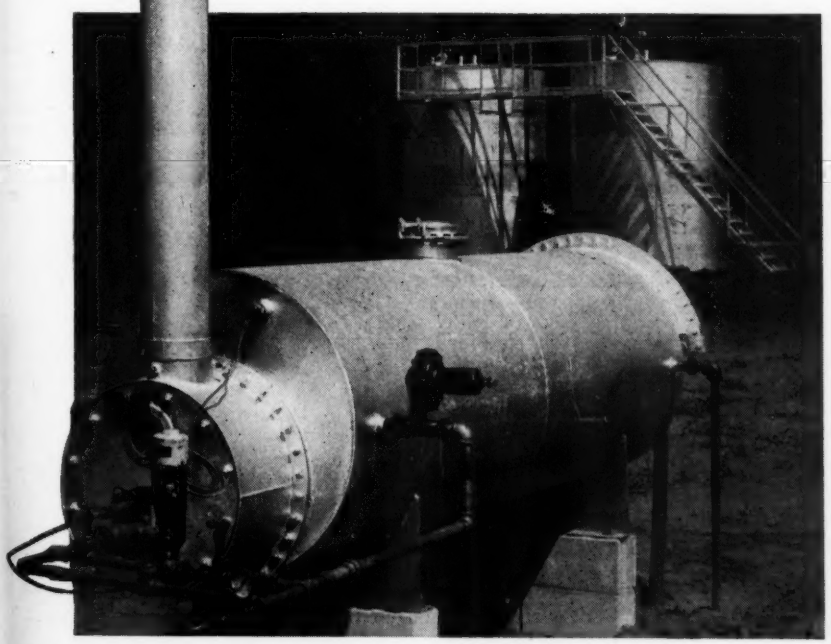

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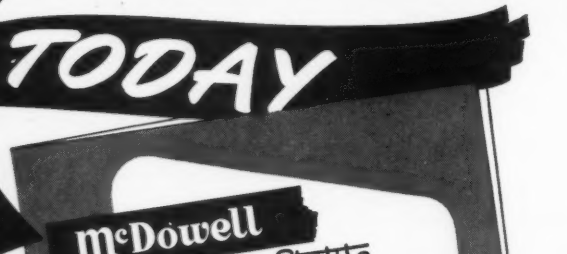

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ing costs of a purification plant or of a purification and dehydration unit likewise are not subject to generalization. In addition to the size of the treating plant and the specifications for the treated gas, many other factors are involved, including the absorption pressure and the composition of the sour gas.

However, it is possible to quote approximate cost figures for typical plants. For example, a plant designed to purify and dehydrate, at pressures of 150 to 600 psig., 50 million standard cubic feet per day of natural gas containing 2 per cent total acid gas would require an initial investment, including utilities, of about $300,000. The direct operating costs for such a plant, including steam, power, solution losses, operating labor, supervision, and maintenance would amount to about 2 mils per thousand standard cubic feet of gas treated. If the plant were to be amortized in 5 years, this would amount to a total cost of 5½ to 6 mils per thousand standard cubic feet of gas treated.

The cost of a gas-treating plant, per 1,000 standard cubic feet per day of gas treated, will vary inversely with the total quantity of gas to be treated, and directly with the operating pressure and acid gas content. Furthermore, it is obvious that operating labor, supervision, and maintenance will be approximately the same for a small plant as for a large one. All of the above applies equally to treating plants only and treating and dehydration plants for purification and dehydration. As mentioned earlier, no general selection of any process system can be made, and each treating problem must be considered individually.

The industrial application of the glycol-amine process is becoming increasingly important. To the best of the author's knowledge, utilization of this particular process first made it feasible to remove H_2S from gas by amine treatment with complete assurance that the residue gas would be sweet to the Bureau of Standards' lead acetate test[3]. This, in turn, led to the possibility of treating sour gas and transporting the purified gas to areas short of fuel and having high purity requirements regarding the H_2S content of the gas.

The outstanding example of this application is the project recently put in operation by El Paso Natural Gas Co. to transmit originally sour gas from the West Texas-New Mexico fields to southern California. And at the same time this is undoubtedly the outstanding example of mass purification of sour natural gas, and more particularly of the large scale use of a single type treating process.

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1. Shoeld, M., U. S. No. 1,971,789 (1934).
2. McCartney, E. R., U. S. No. 2,435,089 (1948).
3. McBride, R. S. and Edwards, J. D., Bur. Stds. Tech. paper TP-41.

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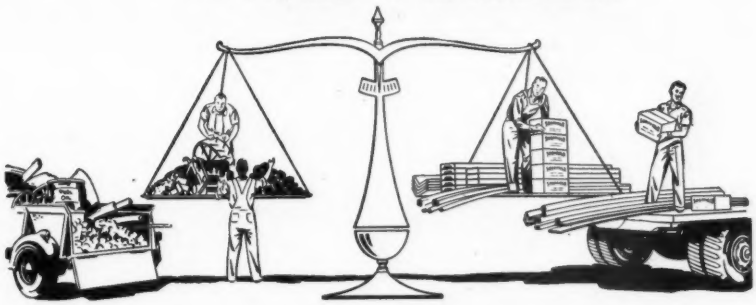

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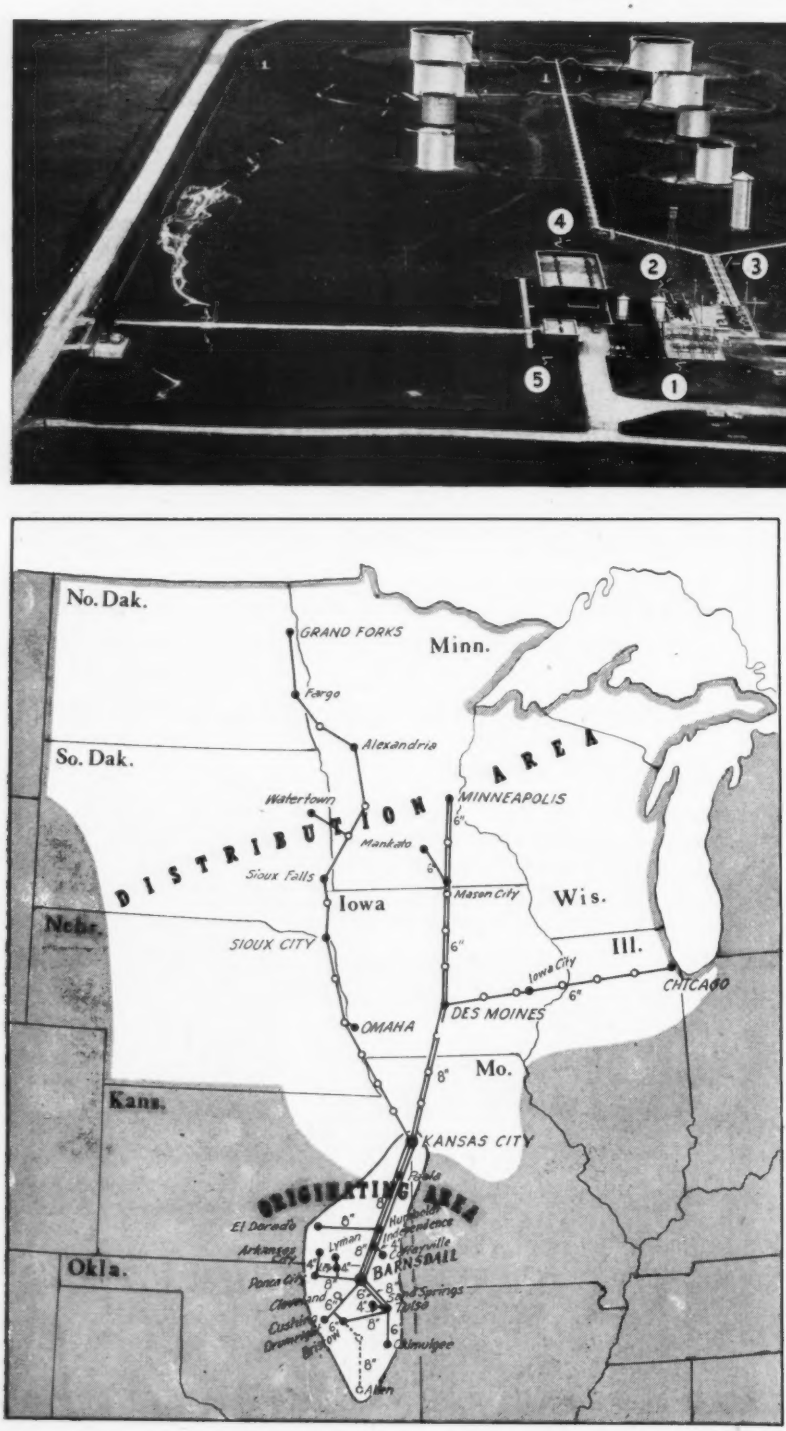


Left: Map of originating and distributing areas served by Great Lakes Pipe Line System. Trunk-line diameters indicate the extent of the use of 8-in. matching lines. Above: Air view of Barnsdall, Okla., terminal showing piping, pump station, and tankage. Numbers indicate (1) The four incoming lines and strainers. (2) The three outgoing lines. (3) Individual piping to tanks. (4) Station building. (5) Former boiler house. (6) Company-owned employe houses

by Paul Reed

TO get an over-all view of what Great Lakes Pipe Line Co. has accomplished in its large postwar revamping and expansion program, attention should be given to operations as far south as the Oklahoma originating area as well as the northern distribution area extending from Kansas City to Grand Forks, N. D., Minneapolis, and Chicago.

This article outlines operating techniques and unique equipment innovations observed by the author on recent tours of the system arranged by Harry Moreland, president and general manager, for groups of industry executives. Traveling by chartered buses and airliners the trip was made from Tulsa via terminals at Barnsdall, Oklahoma; Kansas City; Des Moines and Sioux City, Iowa, for direct observation of the unusual scope of Great Lakes refined-products system.

Through its lines totaling 3,129 miles, in 1947 it moved 32,922,104 bbl.

Top: Flexible connections at Barnsdall terminal which provide for direct flow. Each tank is served by a separate line. Second from top: Barnsdall pump station 810-hp. diesel engines

This traffic amounted to 17,707,456,000 bbl.-miles.

Operations of the company are more comprehensive than these statistics would indicate. For, instead of confining itself to making deliveries into shippers tanks at destinations, Great Lakes delivers all of its traffic at loading racks to tank cars and tank trucks according to shippers' orders. This practice adds to the complexity of Great Lakes operations since it entails extensive storage, laboratory, accounting, and loading-rack operations at terminal points.

Stock in Great Lakes Pipe Line Co. is owned by eight oil companies including Continental Oil Co., Mid-Continent Petroleum Co., Sinclair Refining Co., Texas Co., Pure Oil Co., Phillips Petroleum Co., Cities Service Oil Co., and Skelly Oil Co.

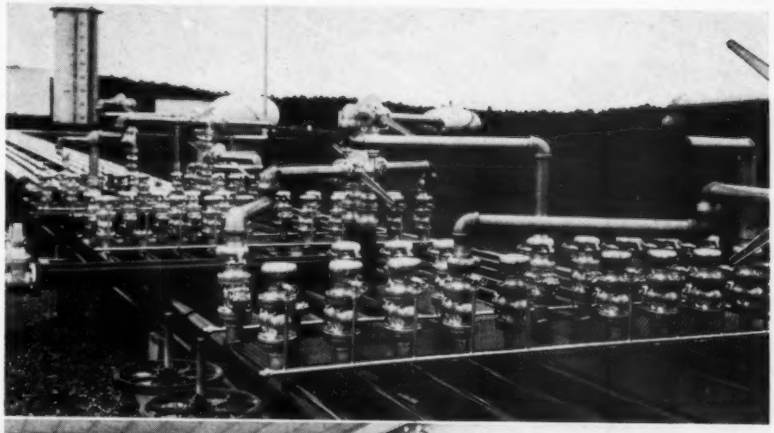
Great Lakes Pipe Line has been exceptional in many respects since its original organization as a pioneer joint effort of several companies to put in operation one of the earliest major products systems, in 1930. A steady program of improvement culminated in an extensive postwar revamping and expansion program with such notable features as adoption of "matching-8-in. line" operation; the serving of terminal tankage with electric gaging, stuffingboxless pumps, special swing connections and separate lines; extensive installation of medium-speed vertical diesels driving centrifugal pumps and elimination of slow-speed horizontal diesels driving reciprocating pumps; and the development of a new type of tank-truck loading machine with pantograph piping and hydraulically operated platform.

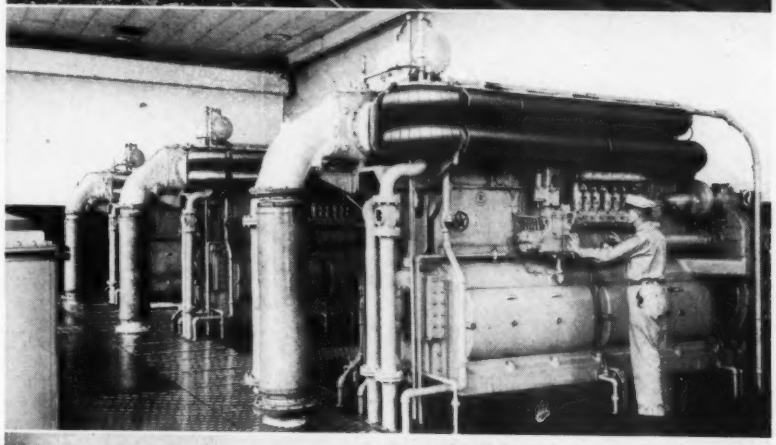
Facilities of the company provided for efficiency, safety, and convenience. Buildings of modern design are substantial and attractive as well as economical to maintain.

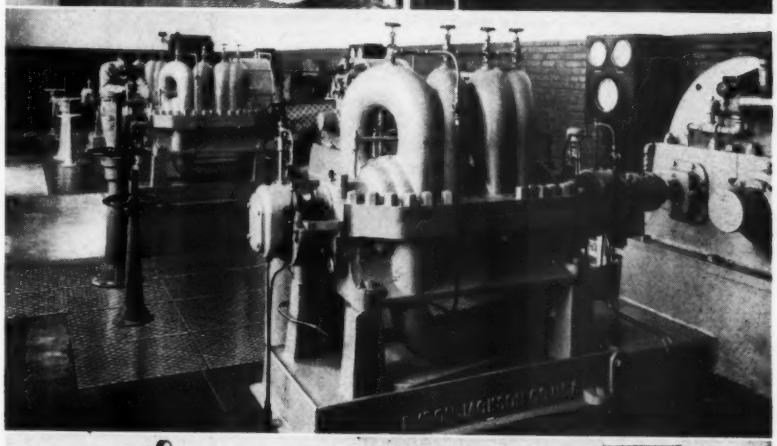
Matching Lines

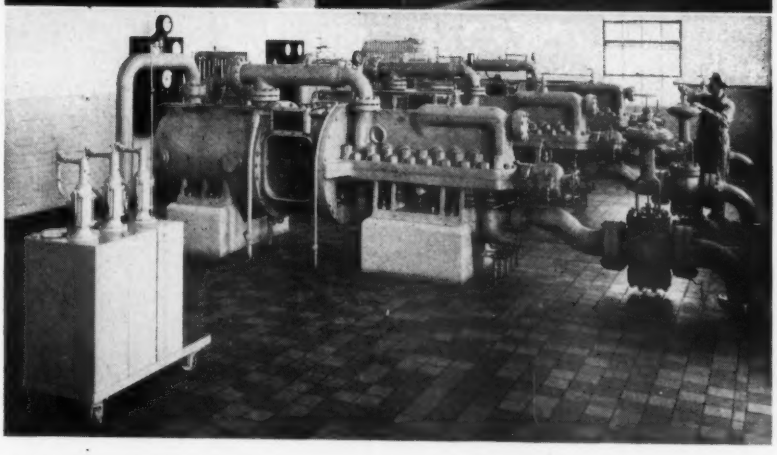
Lines of "matching capacity" have been featured in the revamping and expansion program as far as economically reasonable, in order to minimize mixing and to accelerate shipments. With matching lines tankage may be reduced.

An example of the operation of matching lines may be seen at the Barnsdall, Okla., station where gathering lines converge from several points in Oklahoma and Kansas over a 311-mile network of lines from 15 refineries at 11 locations.

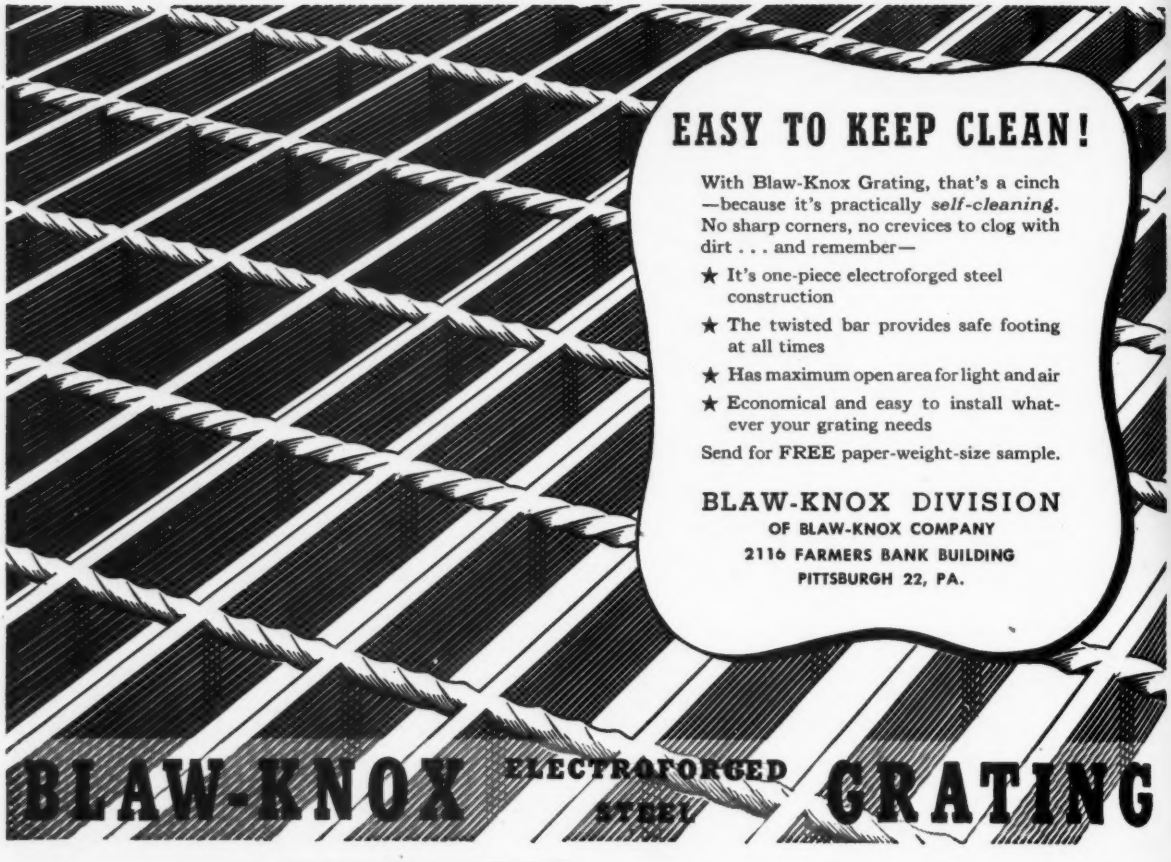








Second from bottom: Six-stage centrifugal pumps separated from engines by fire wall. Bottom: Bennett electrically driven centrifugal pumps. Motors are cooled by immersion in pumped fluid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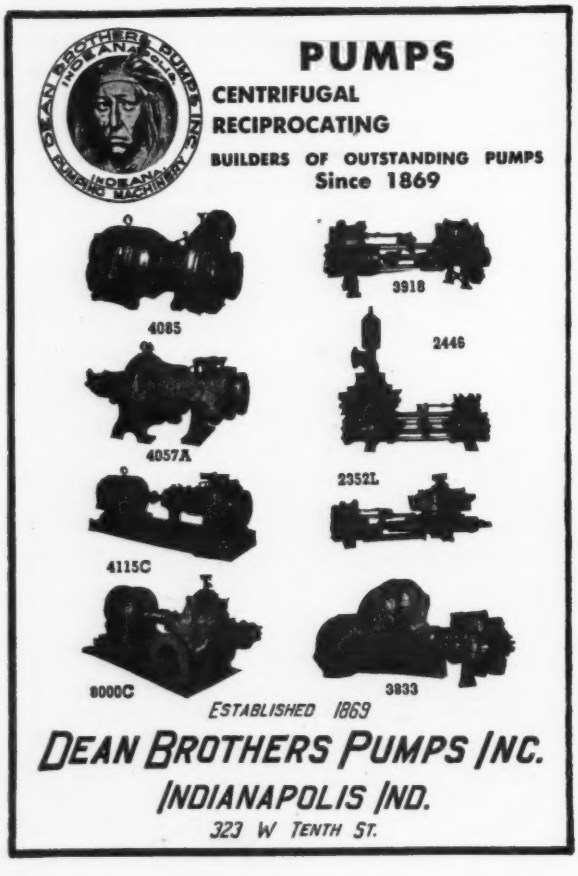
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Dispatchers at central office keep accurate records of line movements reported hourly from pump stations and receiving stations. Hourly gage readings of tanks from which shipments are being received into the line are also recorded

From Barnsdall shipments from two incoming 8-in. lines are pumped on through two 8-in lines and incoming shipments from the 6-in. lines are put into tankage for movements on a third 8-in. line.

North of Kansas City, products move through the northwest 8-in. line to Alexandria, Minn., and through two 8-in. lines to Des Moines. At these points shipments destined for transportation through 6-in. extensions to points beyond are transferred from the 8-in. lines through storage to the 6-in. lines.

Secondary Booster Stations

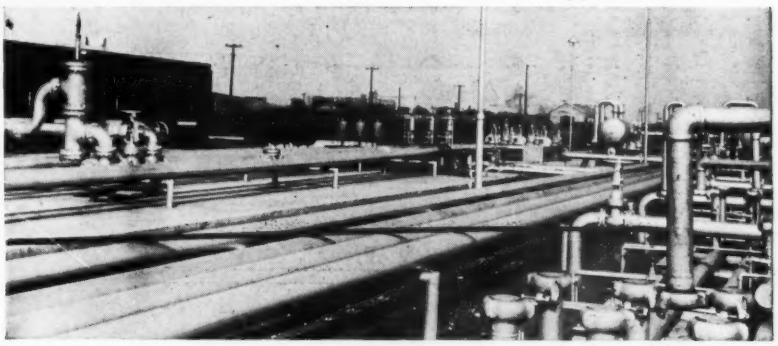
The question of whether to attain increased throughput by either secondary station operation or new pipe-line construction has been recently studied by Great Lakes. Interesting conclusions have been reached from examination of records regarding the Kansas City-Des Moines section in the 1933-1947 period.

The needed capacity was obtained by installation of secondary stations, with an investment $1,608,549 under the cost of adding another line. However, by the end of the period the higher operating cost of these stations, as compared with primaries, wiped out this difference and was actually $1,430,822 more expensive than it would have been had the line been installed with primary station operation.

Depreciation was figured in both cases. Average cost per barrel-mile was nearly twice as high for secondary stations as for line-and-primary-station practice. Actually the advantages obtained by increasing line facilities are much greater than these figures alone indicate. For ample line facilities provide reserve capacity which may be utilized when needed later by putting additional primary-station units into operation.

Labor and other costs, except fuel and repairs, are virtually the same whether a primary station is operating one or more units. Even though long-period operation favors line-and-primary station increases, the secondary station has been convenient in facing traffic increases of uncertain duration in several sections of the system, especially during wartime pipe shortages.

In planning for the future, the company regards the present secondary stations as only temporary expedients. It is anticipating that additional lines, with existing primary stations, will be constructed to provide for permanent demand. This program would also mean that there would be a reserve capacity available later to



Swing connections, piping, and pump stations at Kansas City, Kans., terminal

Above: Rack for loading tank trucks by conventional procedure at Des Moines terminal. Left: Special loading machine at Sioux City, with pantograph piping and hydraulic adjustment of loading platform

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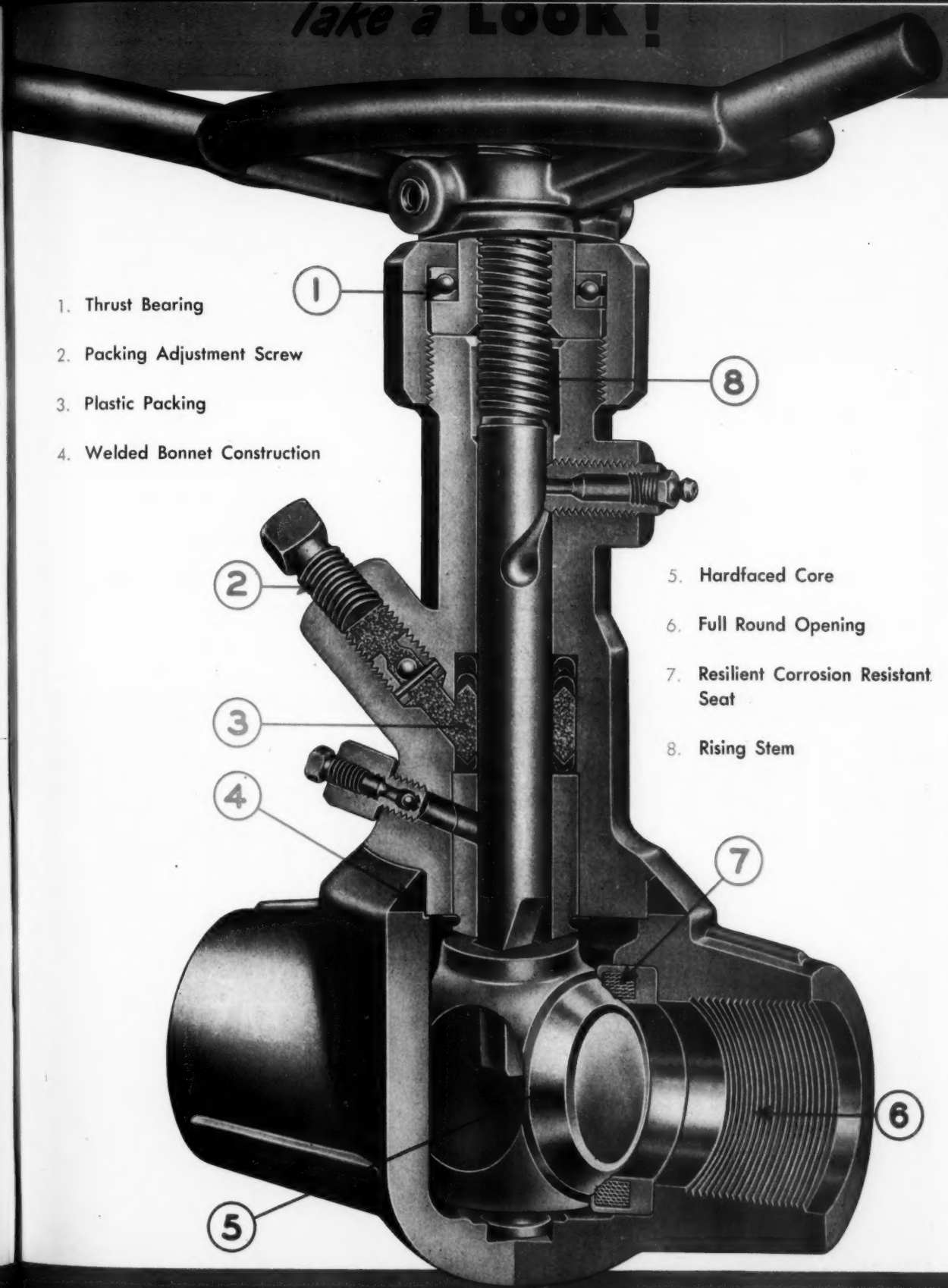

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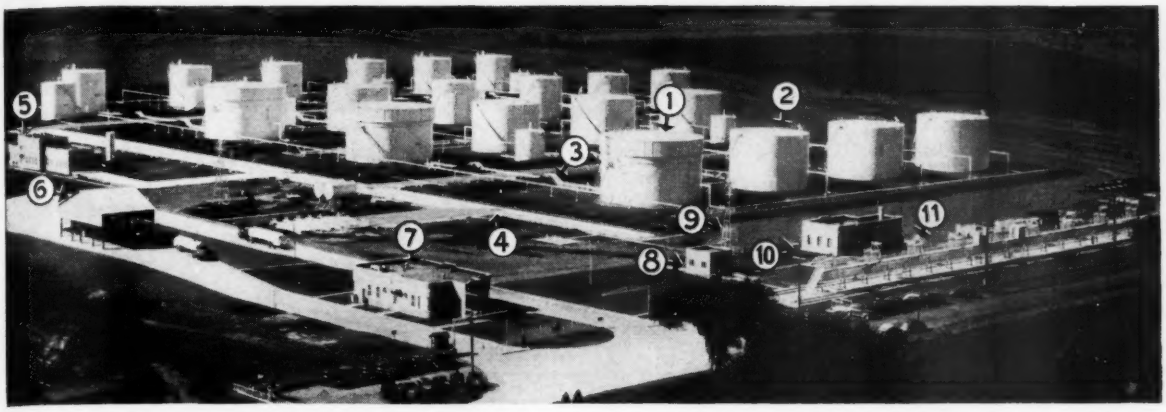

Aerial view of Sioux City terminal. The numbers indicate: (1) Lifter-roof tanks have tied in with them. (2) Cone-roof tanks to form a closed vapor-recovery system. (3) Individual incoming and outgoing tank lines. (4) Tank runs. (5) Pump station. (6) Transport-loading machine. (7) Terminal service building. (8) Boiler house. (9) Flood lights. (10) Tetraethyl lead building. (11) Tank-car loading rack

handle further increases in shipments.

Electrically operated Rannett units at secondary stations on the Kansas City-Des Moines section were installed by Great Lakes in 1933. At that time the system consisted of single lines. Rannett units are of interest because the electric motors direct connected to centrifugal pumps are immersed in the stream of products being pumped; thus the motor is cooled by pumped fluid.

Typical of Rannett units are three at the Kansas City terminal with 700 hp. 2,300-volt, 3-phase, 60-cycle, 157-amp. Allis-Chalmers motors which operate with 70 per cent efficiency. At full load, temperature rise is 55° C. The manner in which Great Lakes utilized Rannett units for secondary stations in the next few years after 1933 is of interest as an indication of the function of secondary units on such a great system.

Originally only four Rannett secondary stations were installed, because additional gallonage in prospect was not substantial. And there was no prospect that it would continue indefinitely. However, the next year the traffic demand justified construction of another 8-in. line partly equipped with primary units which would ordinarily have led to discontinuing the secondary stations. But improved throughput not only prevented elimination of the secondaries but induced the installation of full primary units on the second 8-in. line in 1938. When products movements were reduced in 1939, the operation of the Rannett secondary stations was discontinued until resumption of their operation early in 1942 to aid in carrying heavier wartime shipments.

The $30,000,000 modernization and expansion program, increasing capacity 50 per cent, had not been completed in 1947 when it was apparent that additional capacity was needed.

Prior to the big postwar expansion program, shippers were asked to forecast future movements. On the basis of these predictions, the new northwest line was built with 100 per cent reserve capacity. A third matching 8-in. line was laid between Kansas City and Barnsdall, also with 100 per cent reserve capacity. Optimistically it was expected that peak capacity in both lines might be reached in 5 years.

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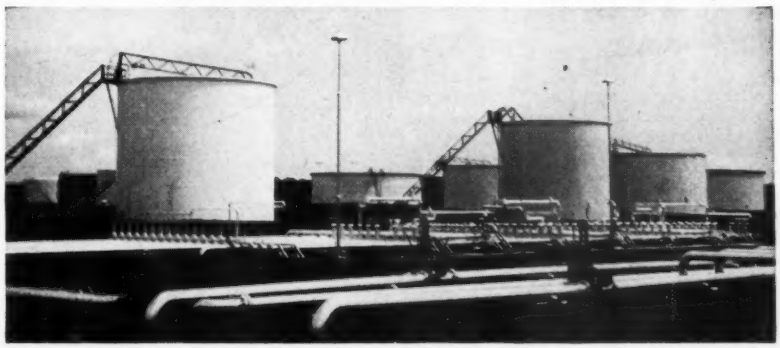
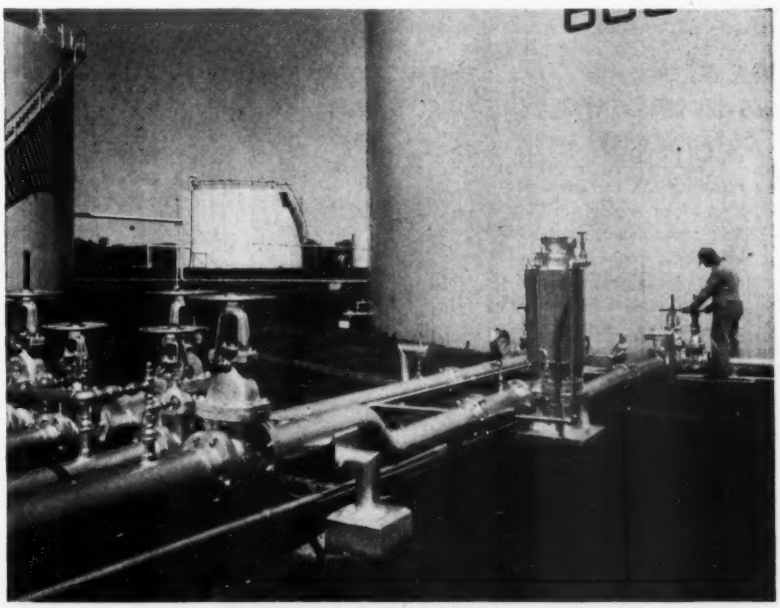
(Continued on page 113)



Tankage and piping at Sioux City terminal



Typical vertical stuffingboxless tank pump at a terminal

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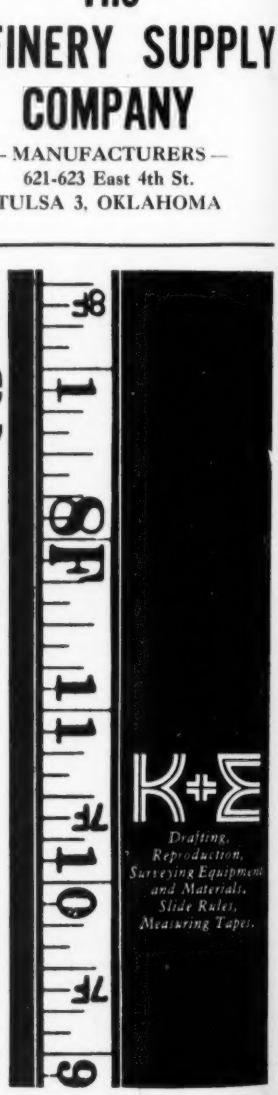

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Maximum Propane Recovery

ITS ECONOMIC AND ENGINEERING PROBLEMS

by Frank G. Noble*

DURING the past 2 years the natural-gasoline industry has received an urgent demand for additional propane production. Although the industry has for a number of years manufactured liquefied petroleum gas and propane for various sales requirements, such manufacture was of small magnitude and somewhat secondary to that of producing natural gasoline. Wartime demand for the lighter hydrocarbons necessitated the revamping and redesign of many natural-gasoline plants to recover high percentages of essential iso and normal butane hydrocarbons. With the resulting butane supply being diverted to the war effort it was necessary for L.P.G. and other customers to find a substitute for butanes. The logical substitute in many instances was propane, which was being produced in sufficient quantities to meet the early demands.

Since 1946, the demand for additional propane has steadily increased, and many operators are now analyzing the economics of higher recoveries in existing plants and in new installations.

*Gas division, Humble Oil & Refining Co., Houston. This paper was presented at the southern regional meeting, Natural Gasoline Association of America, Shreveport, October 15, 1948.

Economic Considerations

Each problem of increasing propane recovery must be treated individually since there is no magic formula for determining the economics. It is desired to mention a number of factors which should be considered in preparing an economic analysis for additional propane recovery. These factors are summarized and briefly discussed:

1. Plant location, product demand, value, and disposition.
2. Future field operations.
3. Investment and increased operating expenses.
4. Selection of maximum percentage recovery.
5. Operating factors.

1. Plant Location, Product Demand, Value, and Disposition

In many cases the location of the plant may affect the maximum propane recovery. Should the location be in some remote area, an appreciable distance from rail and road transportation, considerable investment will be required for product lines, storage, shipping facilities, and roads. The investment for these facilities is considerably reduced if the plant is located such that the production readily may be moved by trucks or tank cars. The sale of the product in surrounding areas, or to a distant destination may influence the amount of storage to be installed in the plant.

In order to obtain a realistic economic analysis, proper consideration should also be given to possible seasonal variation in both demand and product value, and an average sales volume and price should be used.

2. Future Field Operations

The source and supply of potential propane to the plant is of primary concern to all plant operators. Since most plants process gas produced from oil wells, it is important to analyze the probable future operations of the oil field. The science of identifying the type of oil reservoir and the methods of predicting reservoir behavior are well known to petroleum and research engineers.

From estimates of future oil-production rates the engineers may predict future gas volumes and point out any irregularities in production which may be encountered. What is the future forecast on the oil field operations? Will gas-oil ratios remain reasonably uniform, increase or decrease? Will there be gas lift or repressuring operations? With answers to these questions the plant operator is in a

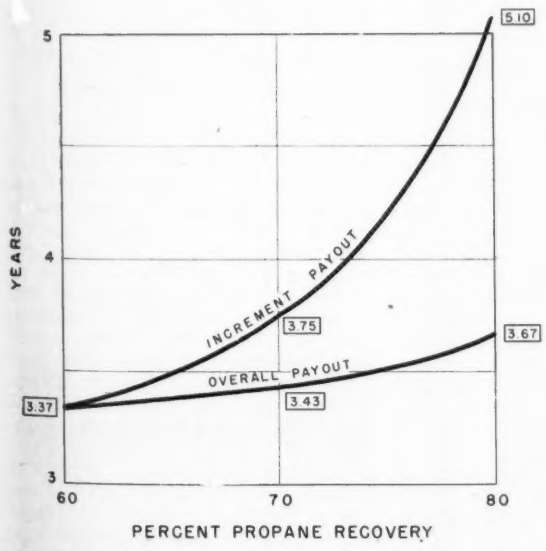

Fig. 1—Comparison of over-all and increment payouts for increasing propane recovery

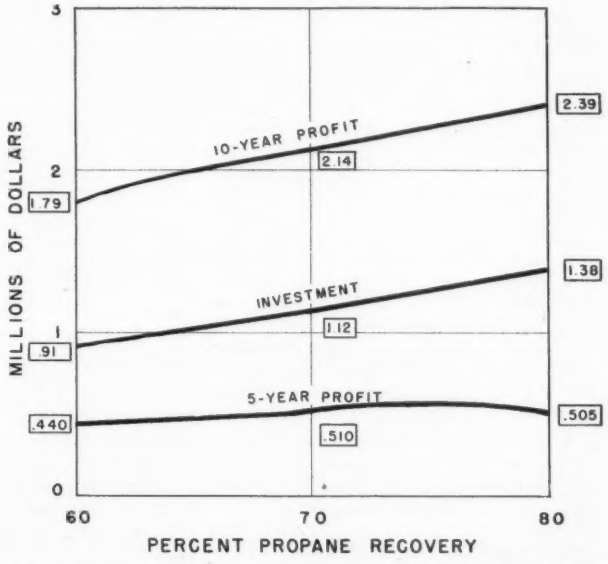

Fig. 2—Effect of operating life on economics of increasing propane recovery

much better position to determine gas volumes, compositions, and survey the possibility of increasing propane recovery in a present plant or to anticipate operations for future requirements.

To illustrate a possible problem: An operator is now producing 20 million cubic feet per day and is advised that within 2 years the gas volume may reach 30 million. On the basis of these data he designs the plant for 75 per cent propane recovery at the 30-million rate. From a detailed reservoir study it is discovered that the 30-million rate will exist for only 1 year with a 5-year average forecast of 25 million. The operator would possibly save money by designing the plant for 75 per cent propane recovery at a 25-million rate and accept a lower recovery at the 30-million rate. Excess absorber capacity can be provided at a small additional cost while compressors may be added as necessary to handle the extra gas load. The additional product to be recovered by designing for 75 per cent recovery at a 30-million rate may not pay out the additional investment required because of the short duration of the 30-million rate.

3. Investment and Increased Operating Expenses

The economics of obtaining high propane recoveries may be governed by a number of physical factors previously mentioned. It is recognized by those familiar with plant design and operation that the recovery of propane requires a different design and operating technique from those of a natural-gasoline plant. Formerly where no market existed for the propane, the propane recovered along with butanes and gasoline was a nuisance to both the design engineer and plant operator.

As the demand for propane increased it was a simple matter in most plants to add fractionating equipment for the recovery of propane already extracted. It now appears that the propane available in most plants is being sold and that a further production will require higher initial extraction from the wet gas. The investment required for higher initial extraction in an existing plant usually involves additional compressors, refrigeration, increased oil circulation, fractionation, boilers, cooling-water system, products storage, and shipping facilities. Construction costs will be higher because of work proceeding in an operating plant, and engineers preparing cost estimates should allow for this contingency.

In preparing estimates to determine maximum propane recovery it is usually necessary to obtain costs for at least three different recoveries, for example, 60, 70, and 80 per cent, or some reasonable combination. As a minimum requirement it is essential that a careful, close cost estimate be prepared for the percentage recovery believed to be most feasible. From this design and estimate, certain costs may be ratioed to indicate the investment for the other recoveries desired.

From the design work required for the close cost estimate it is possible to determine the approximate equipment required and the physical operations upon which additional operating cost may be predicted. It is probably the tendency of most engineers to underestimate both investment and operating cost when analyzing the problem of increased recovery, and this should be guarded against.

4. Selection of Maximum Recovery

After cost estimates have been prepared, a thorough analysis of the economics indicated by these estimates must be made in order to arrive at the maximum propane recovery. For example, the economics of increasing propane recovery in a plant from its present 20 per cent to 60, 70, or 80 per cent may look something like this:

Per cent propane recovery—	60	70	80
Investment	$910,000	$1,120,000	$1,380,000
Gross daily revenue	1,275	1,535	1,787
Daily expenses	535	642	753
Net daily earnings	$ 740	$ 893	$ 1,034
Payout years	3.37	3.43	3.67

It would appear from examination of these figures that the higher propane recovery is more attractive, since substantial increases in net earnings may be had with only a few weeks' increase in the payout time. In order to get a true picture, however, it is necessary to consider not only the over-all payout but also the incremental payout of the additional investment required for each successive increase in propane recovery considered.

Fig. 1 illustrates the relationship between over-all payout and increment payout for the three cases considered. While the over-all payouts for increasing propane recovery to 70 and 80 per cent are only 0.06 and 0.30 years respectively greater than the payout for increasing propane recovery to 60 per cent, the increment payout for increasing from 60 to 70 per cent is 0.38 years greater and for increasing from 70 to 80 per cent is 1.73 years greater. Whereas, the over-all payout of 3.67 years for the 80-per cent propane-recovery plan might indicate this to be an attractive proposition, the indication that the increment increase from 70 to 80 per cent will take 5.1 years to pay out may alter the situation. Unless the expected operating life of the plant is substantially greater than 5 years, then the increase from 70 to 80 per cent would appear economically unsound.

The effect of operating life on the economics is illustrated on Fig. 2, on which investment and ultimate profit (after payout) for 5 and 10-year periods of plant operaiton are plotted against propane recovery. In the case of the 5-year operation, investment for increasing propane recovery beyond about 60 per cent appears unjustified, since substantial increase in investment results in only a small increase in ultimate profit after payout up to about 72 per cent propane recovery, and actually shows a decrease in net profit beyond that point.

In the case of the 10-year expected plant operation, material increases in ultimate profit are indicated for all increases in propane recovery throughout the range of recoveries considered, although the indicated profit increase is slower than the investment for propane recoveries above about 75 per cent. A still longer plant operating life would, of course, show a more favorable relationship between investment and ultimate profit at the higher propane recovery.

After all methods of comparison of economics have been employed, it is sometimes still difficult to choose the maximum percentage propane recovery. In the case of a short plant-operating life the optimum propane recovery is probably that which will give the quickest payout. For operations over a long period such factors as reliability of future gas supply, composition, future product demand, and value should determine whether investment and longer payout for maximum propane recovery is justified by the larger ultimate profit indicated.

The example given here is used merely to illustrate methods of analyzing economics of maximum propane recovery, and should not be considered as a typical example. Under different conditions the trend of economics over the range of propane recoveries considered here might well be just the reverse of those presented. As previously mentioned, each case must be treated individually, as no general conclusions can be drawn.

5. Operating Factors

Of the various operating factors affecting the plant propane recovery we have essentially the same problems as with a plant for natural gasoline and high butane extraction. The effect of daily variations in gas volumes will probably be more pronounced and may require closer coordination and cooperation on flow schedules between the oil producer and plant operator in order to realize maximum recovery. The problems of maintaining proper absorption oil, water treating, and control equipment are familiar to all operators.

Since propane is more difficult to extract and retain it is observed that the processes for maximum propane recovery are more complicated than those for gasoline or high butane recovery. The oil absorption system will

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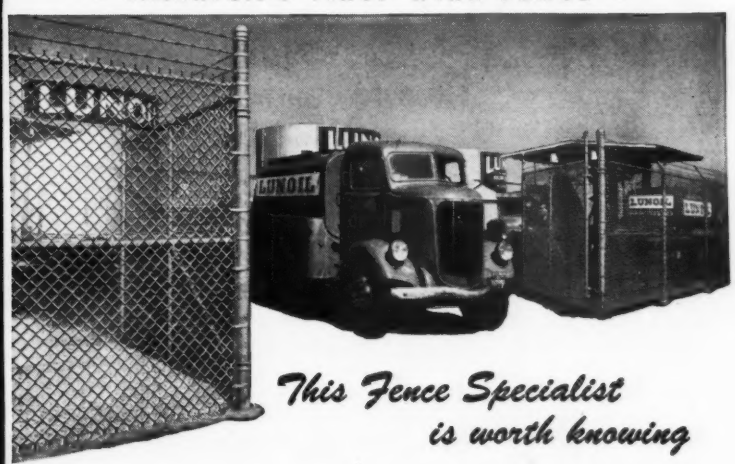

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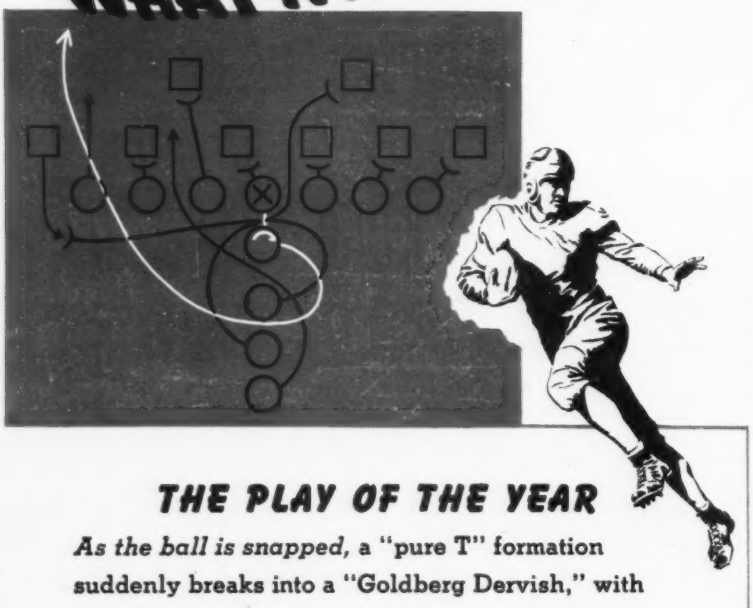

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probably require high and low-pressure stills, recompressors, and reabsorbers, and involve considerable recycle vapors. With these added complications it is important that the plant superintendent and operators give more attention to operating details which formerly had only slight effect on production. It should always be remembered that the only product recovery which will pay out the added investment is that of propane and in order to obtain high extraction efficiencies it is necessary that plant operations be carefully controlled.

One of the most important items which may affect plant propane production is that of proper temperature control. Distribution of available cooling water should be arranged to provide maximum cooling for services which will directly affect propane recovery. Efficient water treating should be maintained to minimize scaling and temperatures should be watched carefully to determine when cleaning of coolers is required. The effect of critical operating temperatures on propane recovery is illustrated by the following example:

	Per cent propane recovery		
Effective temperature—	90°	100°	110°
Absorber	80	76	71
Still top product	80	76	71
Deethanizer reflux	80	78	76
All of above	80	70	58

In this example it is assumed that the normal operating temperature at each of three critical points is 90° F. The individual and combined effects of higher temperatures at these three points are shown. The effects of these temperatures will, of course, vary from plant to plant because of different absorber pressures, gas compositions, and processes employed, but it is believed that this is a fairly typical example. Whereas in straight natural-gasoline plants and high-butane-recovery plants operating temperatures have only a moderate effect on plant recovery, it is observed here that higher temperatures at critical points have a serious effect on propane recovery. It is essential that plant operating personnel recognize the importance of maintaining minimum temperatures at these critical points in order that maximum recovery can be obtained.

The importance of maintaining proper oil-circulation rates is perhaps too obvious to mention. However, there is a tendency among some plant operators to maintain oil-circulation rates considerably below the capacity of the plant equipment involved because the lower rates permit smoother plant operation or perhaps decrease equipment maintenance.

Under certain conditions, however, higher oil rates actually result in lower plant propane recovery. This is true in the case of an absorber or reabsorber which is handling a gas volume considerably below the design volume. If the design oil rate is used

with the reduced gas load, then virtually 100 per cent propane extraction may occur in this absorber. A lower oil rate would result in a negligible decrease in propane extraction, but would materially decrease the amount of methane and ethane absorbed, thus reducing the volume of flash gas farther along in the process. This reduction in flash gas volume might easily result in a net reduction of propane loss. The advantage of reduced oil rates in cases of this kind can be predicted from plant design calculations or from analysis of plant test data. When the plant gas load is subject to wide fluctuations it is desirable to employ proportioning controls to maintain the optimum oil rates.

A factor which is sometimes overlooked in attempting maximum recovery is that of proper segregation of dissimilar gases comprising the feed to absorbers or reabsorbers. Propane and heavier hydrocarbons can be efficiently absorbed from a rich gas with a relatively small amount of absorption oil. If lean gas is introduced into the absorber along with the rich gas it will carry out with it some of the propane which would have been absorbed if the lean gas had not been present. The lean gas may yield only a small amount of butane and gasoline of less value than the propane it "steals" from the rich gas. This can be avoided during plant design by providing separate absorbers for the rich and lean gas, or possibly by introducing the lean gas in the upper portion of the absorber. If such a condition exists in present plants, it is possible that production can be materially increased by bypassing the lean gas around the absorber or reabsorber, or by installing an additional column.

Propane is usually sold by tank car or tank truck for shipment. Since plant revenue from propane sales is determined by the quantity of propane shipped, loading losses should be considered as a factor in plant recovery. In the case of truck or tank-car loading racks adjacent to the storage area, loading losses can be minimized by the use of vapor equalizing lines from the cars to the storage tanks. When the loading rack is a great distance from the storage tanks, equalizing lines may become too expensive and in some instances it becomes necessary to vent the tank cars continuously while loading. When this is done, serious losses may occur unless very careful attention is given to the amount of back pressure held on the vent line. The most satisfactory method of minimizing loading losses is to provide loading pumps with sufficient head capacity to load the cars without venting, or to equalize tank pressures.

Conclusion

In conclusion it is desired to emphasize that high-propane-recovery plants are expensive and that many factors can influence the economics. For an efficient type oil-absorption system the difference in oil circulation for various butane and propane recoveries for a plant operating at a pressure of 800 psi. and processing a lean gas might be as follows:

Per cent butane recovery	Per cent propane recovery	Oil Gal./M.c.f.	Per cent increase
80	25	7.5	...
95	50	14.6	95
99	75	23.8	217
..	85	29.4	292

Since many items of cost in the absorption - distillation system are nearly in ratio to oil circulation, the additional cost of maximum propane recovery is evident from these figures. It is only by a strong consumer demand, steady product value, and reliable source of gas production that operators can justify the expensive systems required for maximum propane recovery.

Acknowledgment

Appreciation is extended to Logan H. Leggett of the gas division of Humble Oil & Refining Co. for his valuable assistance in the preparation of this paper, and to the management of the company for approving its presentation.

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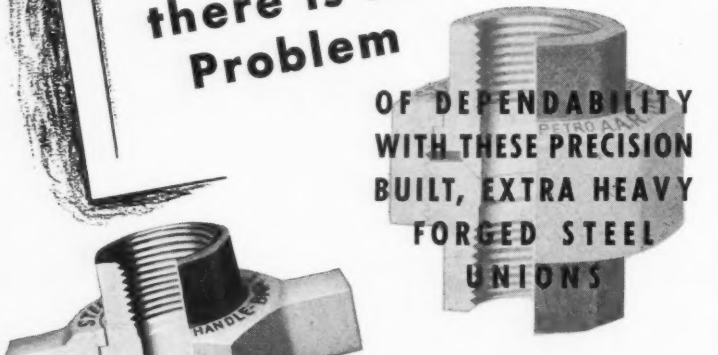

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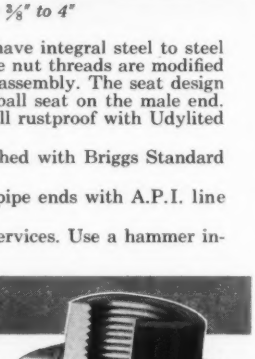
These easy to handle Hi-Speed Handle-Bar Unions have integral steel to steel seats, or completely fused bronze to bronze seats. The nut threads are modified Acme to facilitate easy and speedy assembly and disassembly. The seat design is a 45 degree cone, machined and cold rolled, to a ball seat on the male end. Furnished in black hub ends with Udylited nut, or all rustproof with Udylited hub ends and Parkerized nut.

4000 Test Unions sizes ⅜" to 4" inclusive are furnished with Briggs Standard steam threads in pipe ends.

6000 Test Unions sizes 2" to 4" inclusive have long pipe ends with A.P.I. line pipe threads.

HANDLE—BAR Unions are recommended for all services. Use a hammer instead of a wrench to tighten or loosen the nut.

PETRO



This Union has features that make it the most universally used Union. It is made to A.A.R. standards with integral steel to steel seats. The seat design is a 45 degree cone, machined and cold rolled, to a ball seat on the male end. The ends and nut are extra heavy and the nut threads are permanently lubricated and rustproofed with Udylite Cadmium.

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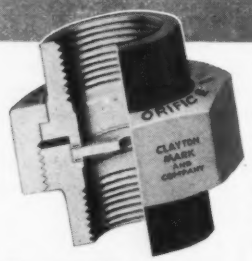
Sizes ⅛" to 3"

ORIFICE



Sizes ¼" to 3"

"ORIFICE" Unions, screwed, or socket weld are widely used for flow control of Steam, Oil, Ammonia, Chemicals, Water, Gas and Air. Also for metering and measuring. The ORIFICE is recommended for working pressures of 600 lbs. at 900° F., or 2000 lbs. at 150° F. Furnished with 18-8 stainless steel orifice plate and steel jacketed asbestos filled gaskets. These are set in a groove of solid steel to facilitate ease of tightening and to safeguard against possible blowing of the gaskets and resultant trouble.

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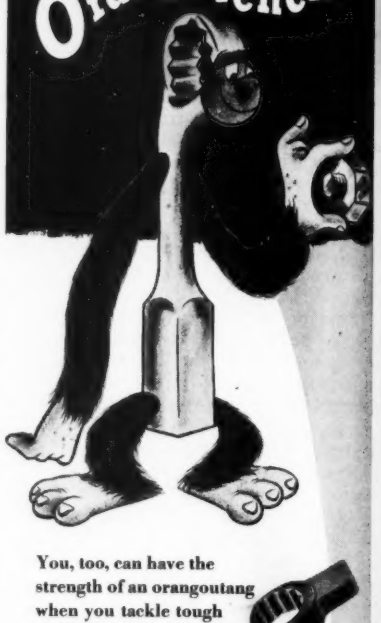

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DIGESTS

SOCIETY OF AUTOMOTIVE ENGINEERS

Here are digests of the papers presented at the national fuels and lubricants meeting of the Society of Automotive Engineers at Tulsa, November 4.

Motor-Oil-Consumption Characteristics (Volatility, Viscosity, Viscosity Index, And V. I. Improvers)

CARL W. GEORGI, Technical Director, Research Laboratories, Quaker State Oil Refining Corp.

PRELIMINARY work on developing a laboratory engine-test method for evaluating oil-consumption characteristics indicated that multicylinder engines of commercial types tended to display considerable variations in consumption values in spite of the closest possible control of engine condition and operation. In order to minimize engine variables to the optimum possible extent, a single-cylinder test engine was selected (Model H-2 Lauson oil test engine).

The particular engine operating conditions chosen may be described as moderate as to speed, load, and temperature, and during the 20-hour test period oil oxidation was negligible with all but very unstable types of motor oils. Emphasis was thus placed upon consumption and the physical properties of oils relating thereto, rather than upon oil stability, oxidation resistance, detergency, and the like.

Tests with the "reference oil" were necessary to run in the engine and to establish consumption at the basic level. The next tests then established the basic consumption pattern for the reference oil in the given engine setup. (In all of the work reported herein the reference oil was an S.A.E. 10 grade of 48 seconds Saybolt viscosity at 210° F., and 110 viscosity index.) After the initial calibrating runs, tests on oils of unknown consumption characteristics are then alternated with runs on reference oil. After 20 test runs on this particular engine setup, consumption results became erratic and the series was terminated for engine overhaul.

Since different engine setups developed basic consumption patterns varying from 3 to 6 g. per hour, consumption values on unknown oils must thus be reported as "consumption ratios" rather than in actual quantities, such as grams per hour. It is interesting, however, that by this method repeat tests on many oils in different test-engine setups checked within the same limits of reproducibility as did repeat tests on the same oil in the same engine setup. Even under nearly ideal conditions of test as to control of engine and operation uniformity, consumption values on the reference oil vary by some 20 to 25 per cent. This may be taken as factual evidence it is extremely difficult to evaluate motor-oil consumption characteristics with a high degree of precision.

From the initial oil change in the engine and the total oil consumed during the tests, it is possible to estimate the per cent of oil which was apparently lost by "volatility." Although there is no precise correlation between flash points and vacuum-distillation ranges of motor oils, the data developed from these tests indicate that oils having flash points above about 380° to 400° F. may be considered as satisfactorily "nonvolatile."

Fig. 1 summarizes results of tests to study the relation of oil viscosity to consumption. All of the test oils were of 105 to 115 viscosity index, the V. I. decreasing progressively with increases of viscosity. The oils of S.A.E. 10 grade and heavier all had flash points and distillation curves well above the minimum limits indicated to be necessary for "nonvolatility," so that the consumption differences shown may be taken as due essentially to viscosity.

Fig. 2 summarizes results of tests to study the relation of viscosity index to consumption. All of the test oils were of 48 seconds Saybolt viscosity at 210° F. The oils of 38 V. I. and higher all had flash points and distillation curves above the minimum limits indicated to be necessary for nonvolatility, so that the consumption differences shown may be taken as due essentially to viscosity index.

Viscosity index is indicated to be an important factor in oil-consumption characteristics, the very high V. I.'s obtainable with improper additives suggest interesting possibilities. A rather extensive study of the effect of V. I. improvers on oil-consumption tendencies was accordingly undertaken.

On the basis of the laboratory engine-test data, viscosity-index improvers are indicated to have very distinct limitations, and do not decrease oil-consumption characteristics to the extent which might be indicated from a literal interpretation of the viscosity and viscosity index values obtained in the customary manner by means of Saybolt or glass-tube kinematic viscosimeters.

In an attempt to find reasons why the V. I. improvers did not improve motor-oil consumption characteristics to any significant extent, a limited amount of work was done with a rotary, thin-film viscosimeter to determine the relative viscosities of oils at high rates of shear. One of the most interesting features of this investigation is the correlation between the viscosity-shear data and the oil-consumption data. The data indicate that petroleum oils containing viscosity index improvers are non-Newtonian fluids and on exposure to high rates of shear tend to approach the viscosity of the original base oil.

Since accurate consumption data are difficult to secure even in the laboratories under ideal conditions, road data of acceptable significance are vastly more difficult of attainment. Because of the greatly increased number of variables on the road, tests on only a few vehicles may be greatly misleading, and statistical averages of a large number of vehicles tests are really necessary for dependable information.

With proper selection and control of operating conditions, laboratory engine tests for studying oil-consumption tendencies yield results which correlate reasonably well with road performance.

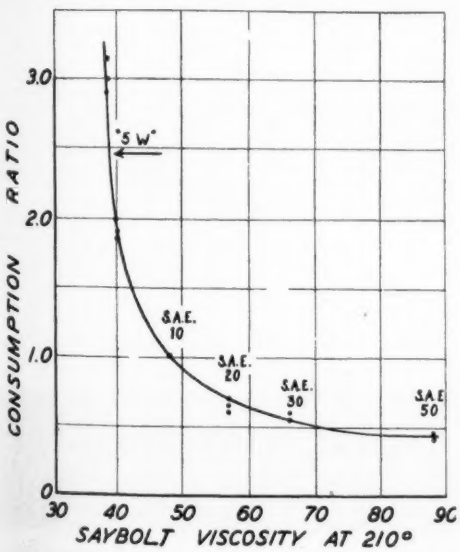

Fig. 1

A Single-Cylinder Laboratory Procedure to Predict Road Antiknock Performance

F. T. FINNIGAN and E. M. CLANCY, JR., Research and Development Laboratories, The Pure Oil Co.

HOW to predict accurately the road antiknock performance of a motor fuel in the laboratory over the range of engine operation, without road testing, presents a problem. In numerous instances a reasonable prediction of this performance can be made from motor and research octane values; however, data so obtained fail occasionally to be of a conclusive nature. If a satisfactory procedure could be evolved,

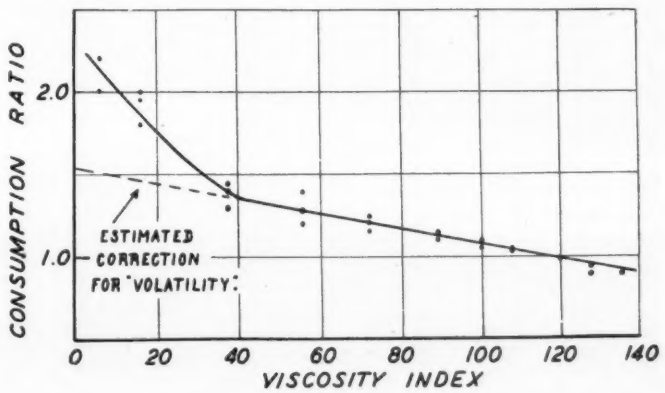

Fig. 2

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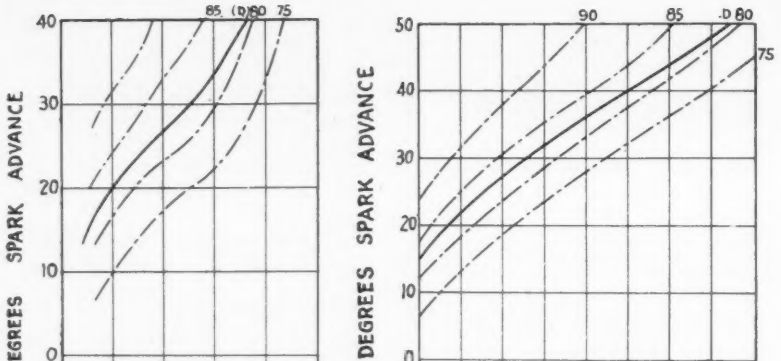

Fig. 1—The plot on left shows borderline knock curves and the one on the right shows C.F.R.X. knock curves

it would be of extensive use as a screening tool as well as producing a method of test which would be independent of the weather. The Pure Oil research and development laboratories launched a project early in 1946 with the intent of satisfying this end, in so far as its needs might dictate.

The C.F.R. engine equipped with a high-speed crankcase, high-lift camshaft, and an aluminum piston was selected as the fundamental tool around which the procedure was to be built. This engine was coupled to a 25-hp. eddy-current dynamometer, thus making variable speeds and load control possible. The induction system incorporated a standard C.F.R. ice tower coupled to a manifold fitted with an industrial updraft carburetor, the manifold being equipped with suitable heat-control apparatus.

The principles of the Borderline road test method were selected as a basis for this development work, with deviations being made as operating conditions might demand.

Due to the noise level of the C.F.R. engine, especially at high speed, the human ear proved highly ineffective as the knock-determining medium, and it was apparent that a more satisfactory tool had to be found to accomplish the task.

A magnetic pressure-type pickup coupled to an oscillograph was installed on the engine in the bouncing pin hole. Through the use of this installation, it was possible to obtain favorable knock impressions on the oscillograph. The apparatus proved itself with regard to reproducibility throughout the speed range.

Air-fuel data were obtained using an exhaust-gas analyzer, first passing the gases through a mild condenser to preserve the life of the instrument. This operating principle is cited as it is realized that an instrument of this type is questionable as to accuracy; however, from the standpoint of day-to-day, unit-to-unit comparison, it did achieve reproducible results.

A road-test program inaugurated to secure a fresh and more extensive library to use a reference guide was reasonably broad in scope, the details of which included: the running of a 1947 Buick Roadmaster for road testing fuels and a 1946 Chevrolet for air-fuel ratio and intake-manifold-mixture temperature data.

A consolidation of conditions brought to light by the road-test program were incorporated, resulting in a single-cylinder laboratory fuel-test procedure that has proved capable of foretelling the road-octane values of a fuel to within favorable limits throughout a range of speeds and compression ratios.

To obtain a fuel rating employing this procedure, the speed is held constant at each increment allowing a short period for the conditions just elaborated on to be standardized; then, the spark is advanced until a pattern representing the desired degree of detonation is obtained on the oscillograph. At no time should the operator be influenced by the noise level of this detonation, as it has been found that this level may vary from fuel to fuel and erroneous ratings may result. Plot sheets similar to those employed by the Borderline road-test method are used for plotting the fuel-rating curves.

Fig. 1 illustrates a framework obtained by the Borderline road-test method and one by this laboratory procedure. In each instance, the same fuel is rated by each procedure and the resulting curve is plotted on its respective framework.

A Proposed Road Octane Number

F. R. WATSON, Engineer; F. H. CAUDEL, Engineer; J. D. HELDMAN, Technologist, Shell Oil Co., Inc.

THERE is still a cogent need to evaluate the relative antiknock quality of motor gasolines in cars in general; that is, to be able to establish a relative road rating which will "accurately reflect average consumer reaction to the antiknock characteristics of a fuel." Such a road rating, herein called the Road Octane Number (R.O.N.) which may facilitate the practical economic evaluation of the antiknock performance characteristics of motor gasolines, is proposed.

It is believed that such a road octane number will adequately meet these four criteria: (1) the antiknock performance of a fuel in so far as the "population" of cars is concerned; (2) a one-number expression which is numerically associated with antiknock performance quality; (3) a stable standard of antiknock quality; (4) ready determination, directly by road testing and, if practicable, indirectly from correlation established with laboratory engine tests.

The road octane number of a gasoline may be defined as "the per cent isooctane in normal heptane which will give knock-free performance in exactly the same per cent of cars in general as does the gasoline." As so defined it reflects the antiknock performance in cars as a whole, is a single number based upon the well-established octane scale, and may be determined either directly by road testing or indirectly from correlation established with the laboratory research method (F-1) and motor method (F-2) octane numbers.

Determining road octane number directly from road tests involves: (1) the choice of a sample of cars for the test. (2) The application of some method for determining the octane-requirement of cars. (3) The series of primary reference fuels (blends of isooctane in normal heptane) in increments of five octane numbers or less tested in each car, along with the gasoline being rated.

When the testing is complete a road octane number can be calculated for the gasoline. First, the per cent of knock-free cars is computed for each of the reference fuels and plotted as "per cent of knock-free cars" vs. "octane number." Knowing the per cent of knock-free cars for the gasoline, the reference fuel plot may be consulted to find the reference-fuel octane-number equivalent to that per cent knock-free cars. The value thus obtained is the road octane number, i.e., the octane number of the primary reference fuel which gives knock-free performance in exactly the same per cent of cars in general as does the gasoline.

To obtain the road octane number indirectly from the laboratory F-1 and F-2 engine ratings, a practical correlation must first be found. A simple and direct method is to relate road octane numbers to the corresponding laboratory numbers by the use of empirical equations.

The antiknock requirement characteristics of several groups of individual makes of cars were examined by this method, yielding information of interest both to petroleum refiners and car-engine designers.

Lubrication Engineering—The United States Air Force's Approach

E. M. GLASS, Chief, Petroleum Products Unit, Materials Laboratory, Engineering Division, Air Materiel Command, Wright-Patterson Air Force Base.

THE entire program of lubrication engineering as practiced by the United States Air Force is covered by Specification AN-L-32, General Specification for the Lubrication of Aircraft. This specification was promulgated through the combined efforts of the Bureau of Aeronautics and the United States Air Force and was issued September 12, 1945. The fact that this specification is a contractual requirement for all experimental, service test, and production equipment being procured by the Air Force indicates the unusual importance placed on lubrication by the U.S.A.F.

The key to the program is the basis for the selection of lubricants by equipment manufacturers for aircraft and components procured by the U.S.A.F. The equipment manufacturers are required to select lubricants on the basis of (1) performance and/or other test requirements of the detail specifications covering aircraft equipment and components requiring lubrication, and (2) current practice proven satisfactory in the field. It is required that the selection of lubricants be made from Air Force-Navy Bulletin No. 275 which lists those specification lubricants that are standard items and already stocked at all U.S.A.F. installations.

It has been possible to reduce the number of lubricants in stock from 400 special lubricants to approximately 20. This unusual reduction of lubricants has greatly simplified field maintenance, supply, transportation, and procurement and has undoubtedly reduced the costs involved in the lubrication of aircraft and its components to a marked degree. Since very few cases have arisen since the promulgation of this specification where standard lubricants have not been able to perform adequately in procured equipment, no special procurements or special handling of lubricants has been necessary.

Finally and what is considered on the the most basic benefits upon which all others depend, the lubrication-engineering program as practiced by the United States Air Force has welded together a partnership between the design engineer and the lubrication engineer with the result that aircraft equipment in addition to being

mechanical engineered is lubrication engineered in the mutual creation of an air force second to none.

Field Experience With High-Sulfur Diesel Fuels

R. J. FURSTOSS, Caterpillar Tractor Co.

SMALL-BORE medium-speed diesel engines are subject to extreme cylinder and ring wear and to combustion-chamber deposits when fuel having a sulfur content in excess of 0.5 per cent is burned. The wear and deposits produced in these engines are jointly influenced by some engine design and operating characteristics, however, they are separate and distinct effects generated by the combustion of high-sulfur fuels and can be isolated one from the other under favorable circumstances.

Cylinder wear resulting from high-sulfur-fuel operation can be minimized by a close control of the minimum temperature of the affected zones. Corrosion-resistant materials will also reduce the amount of cylinder wear experienced with operations on such fuels; however, the selection of these materials must be economically justifiable. With either of the foregoing methods for reducing the influence of corrosion upon cylinder wear, there is also an attendant decrease in top piston-ring wear experienced. Hard chrome plating of the top ring is a very effective and additional influence on reducing ring wear.

While considerable reduction in both cylinder and ring wear was obtained by alteration of engine-design features, it was not until improved lubricant was applied to engines under the various operating conditions that a major reduction in deposit accumulations was observed.

Improved lubricants are a simple, economic, and the most easily applied solution to permit the engine operator in the field to obtain satisfactory engine performance with fuels available in a specific area.

Special Heavy-Duty-Type Engine Oils

J. A. EDGAR, J. M. PLANTFEBER, and R. F. BERGSTROM, Shell Oil Co., Inc.

WHILE the cleanliness and resultant performance life of diesel engines have been increased decisively by the use of heavy-duty oils containing metallic soaps, there are conditions which produce wear and fouling beyond the control of conventional heavy-duty oils.

A compounded special heavy-duty-type oil has been produced which differs from normal heavy-duty oils as follows:

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2. Oxidation stability—in the highest heavy-duty level.
3. Stability of the additive to high piston temperature—above the best heavy-duty oil level.
4. Antiwear property—ability to reduce corrosive wear far beyond normal heavy-duty oil experience.

In those instances in diesel-engine service where normal heavy-duty oils have proved inadequate, the special heavy-duty-type oil has corrected corrosive wear and fouling, whether these conditions owed to unusual operating conditions, or to the use of sulfurous fuel, or both.

While field experience has shown the special heavy-duty-type oil to protect against corrosive wear throughout the periods of use established as good practice in diesel engines, the marked reduction of corrosive cylinder wear is accompanied by the consumption of additive. When continued service results in the development of a strong acid number by A.S.T.M. Method D-664-46T, the anticorrosive property disappears.

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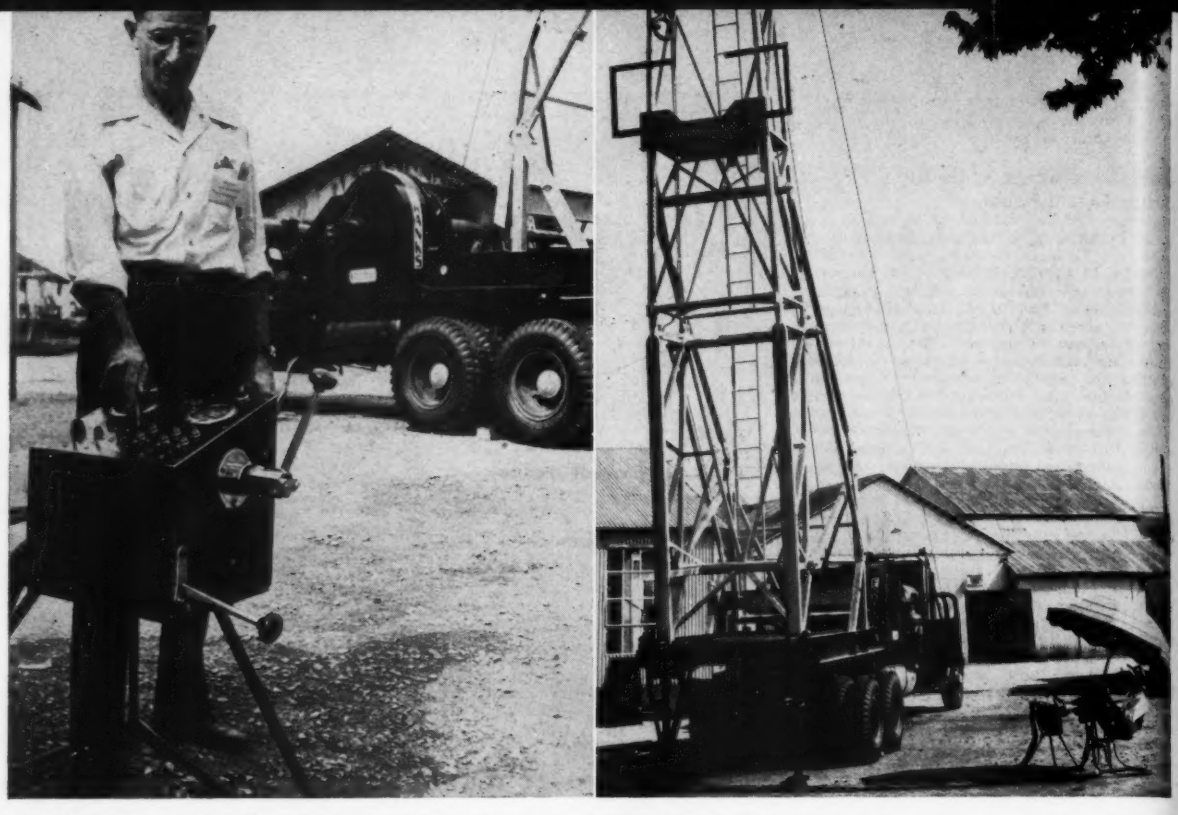


Left: John Province, Phillips Petroleum Co., stands beside the tripod-mounted panel which operates the new remote-control well-pulling unit (truck-mounted). The remote-control unit has 19 service mechanisms (switches, gages, lights) on its board. Right: Pulling unit set up in warehouse yard—note operator at right, in a "clear" position to control unit and supervise all well-floor operations

New Remote-Control Feature Aids Service-Unit Efficiency

by George Weber

IMPROVED crew efficiency and greater economy in field equipment along with safety features are being realized by Phillips Petroleum Co. through use of a new remote-controlled well-servicing unit. The remote-control system utilizes compressed air for the complete operation of the unit. This includes the control of the hoist and engine clutches, winch brake, gear shift, and engine throttle.

The remote-control mechanism is centered in a portable box about the size of half an apple crate and weighs approximately 50 lb. This box is connected to the unit proper by a 40-ft. bundle of flexible air hoses and electrical cables. This permits the unit operator to work at ground level and to move his control position to any point within a 40-ft. radius that he may consider desirable.

Physical effort required of the operator has been reduced to a minimum, for the routine clutch and brake operations demand little more exertion than the shifting of gears on a passenger car, while all other operations are by electric toggle switches. As a safety measure, the brakes are automatically locked in the event of an air failure.

The mast is of all-welded construction and has a hook-load capacity of 66,000 lb. with three links to the tubing block. The raising and lowering operations are accomplished by power from the truck engine through links that also act as bracing members when the mast is in upright position. The mast can be raised or lowered in approximately 1½ minutes and the tubing or rod lines remain strung up at all times. The tubing platform has a capacity of 4,500 ft. of 2½ or 3-in. tubing and 6,500 ft. of ¾-in. rods.

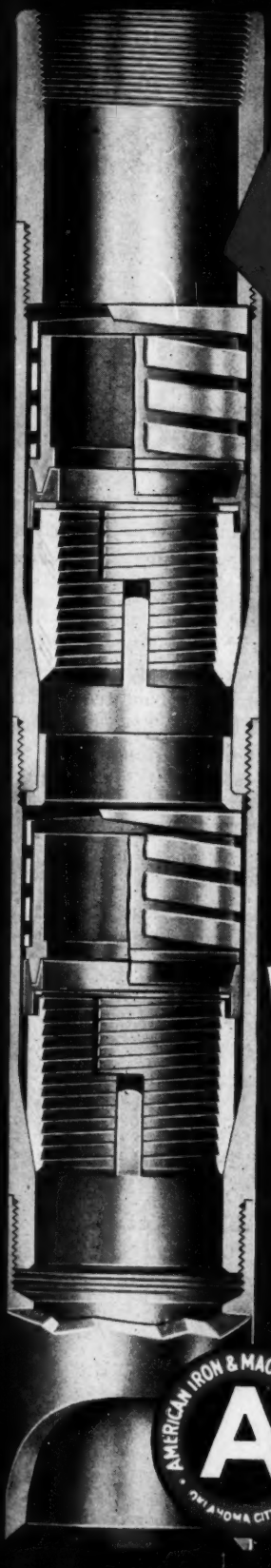
A pneumatic hoist transfers the sucker rods from the elevator to the rod hanger. The mast can be leveled by means of a hydraulic cylinder operated through the medium of a 12-volt hydraulic pump and starter button when the truck is in an inclined position due to the irregular contour of well location.

Three Units in Service

Three of the new units are now in operation on Phillips leases in West Texas, Oklahoma, and Kansas. The West Texas unit, pictured here, is operated by Phillips' Odessa service unit, and will care for about 130 pumping wells located over a wide area in the Permian basin and Central West Texas. Paraffin cleaning constitutes the bulk of such well servicing in that area. The average time required for a cleaning job has been about 6 hours in the past. Reduction of that time to 4 hours is anticipated with the new unit.

The principle of remote control provides obvious advantages in well servicing. It allows the operator to select a position from which he can watch the derrick man, at the same time remaining close enough to the well head to lend a hand if necessary. The use of air-driven tubing tongs mechanizes the unit to the extent that it can be used for a variety of service jobs with a three-man crew and driver.

The control unit (see photos) is carried in an accessible weatherproof compartment under the left side of the truck bed. The air-hose connections remain intact in transit and the unit is readied for operation simply by placing it on a tripod stand at the selected position.



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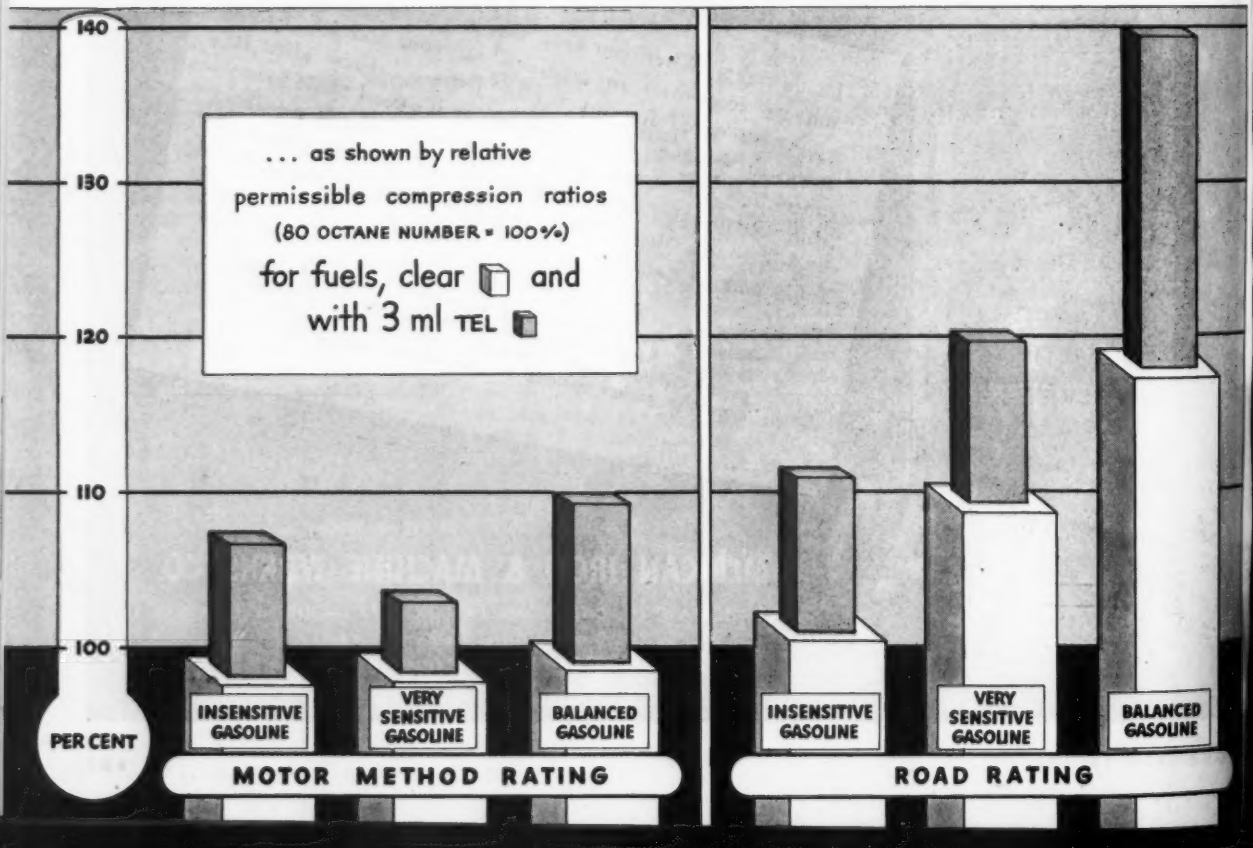
How can refiners gain these greater returns? Production of balanced gasoline is an approach that should be considered.

Ethyl research has shown that the hydrocarbon distribution over the boiling range of a gasoline has a big influence upon its road performance . . . the final criterion of any motor gasoline.

The charted study showing the gain in antiknock quality from the addition of 3 milliliters of tetraethyllead to base gasolines of three representative types—an insensitive, a very sensitive, and a balanced gasoline—tells a clear-cut story of balanced gasoline superiority. The vertical scale of the chart is proportional to the relative per-

TETRAETHYLLEAD GIVES GREATEST IMPROVEMENT TO BALANCED GASOLINE



with balanced gasoline*

missible compression ratio, with 100% corresponding to that allowable with a blend of standard reference fuels of 80 octane number.

Motor method rating not the whole story

Each of the three base fuels has a Motor method rating of approximately 80. When tetraethyllead is added to the insensitive gasoline, its antiknock quality is improved 8%. The very sensitive gasoline shows only half that improvement, and it is because of this poorer showing that sensitive gasolines are often thought of as yielding short returns from tetraethyllead. Continuing with ratings by the Motor method, the addition of tetraethyllead to the balanced gasoline gives an improvement somewhat greater than that obtained with the insensitive gasoline.

When the three fuels are compared in cars on the road before and after the addition of tetraethyllead, a more realistic appraisal is obtained of the benefits of "Ethyl" antiknock compound. In the insensitive gasoline tetraethyllead yields an improvement on the road somewhat greater than it did by the Motor method. In the very sensitive gasoline, although the gain produced by tetraethyllead on the road is more than double the gain obtained by the Motor method, the improvement is virtually the same as the improvement in the insensitive gasoline.

Balanced gasoline gives spectacular results

When the balanced gasoline is rated in cars on the road the benefits are found to be spectacular. For now the improvement in antiknock quality resulting from tetraethyllead is more than double that obtained in the very sensitive gasoline. Furthermore, without tetraethyllead, balanced gasoline shows a much greater increase in road rating over Motor method rating than does the very sensitive gasoline. A comparison of the Motor method ratings of the base fuels *without* tetraethyllead, with the road ratings of the base fuels *plus* tetraethyllead, indicates that the balanced gasoline has a 93% greater improvement *overall* than the very sensitive gasoline.

The Ethyl Laboratories study the principles of "balancing" gasolines for optimum tetraethyllead effectiveness on the road as a service to refiners in their efforts to obtain the highest measure of performance from every drop of "Ethyl" antiknock compound.

This message is the eighth in a series dealing with problems faced by refiners in producing gasoline for today's and tomorrow's engines, and the contribution of the Ethyl Corporation to their solution. Future messages will discuss other phases of this complex problem.

* A balanced gasoline has a distribution of hydrocarbon types with respect to boiling range so controlled that it will give optimum road antiknock quality and optimum improvement from the addition of tetraethyllead at all engine speeds.

At Ethyl's San Bernardino Laboratories weather conditions make possible the testing of fuels in vehicles on the road the year round.

Complete road and laboratory data on this program are incorporated in Ethyl Research Laboratories Report ER-263, obtainable upon request.

ETHYL CORPORATION
RESEARCH LABORATORIES
1600 WEST EIGHT MILE ROAD, DETROIT, MICHIGAN
2600 CAJON ROAD, SAN BERNARDINO, CALIFORNIA

QUESTIONS on TECHNOLOGY

by **W. L. Nelson**

Consulting Engineer

Heat Liberation When Sulfide Ignites

What are the chemical reactions involved and the amount of heat generated when iron sulfide (scale from the inside of pipes exposed to hydrogen sulfide gas) ignites on being exposed to the atmosphere?—R.W.M.

Although the autoignition of sulfide scale is a well known phenomonon, few articles pertaining directly to this subject are available. However, "Ferro Sulfide Source of Unexplained Tank Fires" appeared in The Oil and Gas Journal of February 4, 1943, page 33.

Difficulty is most frequently encountered with the tube bundles of exchangers and with naphtha rundown tanks. However, thick deposits of scale may be found in almost any steel equipment. Upon shutdown the lines and vessels should be flushed with water and left full of water until the equipment is opened. Tube bundles should be sprayed with water while being withdrawn from the shell of the exchanger and the open equipment should be kept moist during cleaning. Small equipment should be moved to safe areas of the plant for cleaning, and the sulfide scrapings should be kept moist until they are buried. The walls of tanks should be sprayed with water during cleaning. Floating-roof gasoline tanks suffer less corrosion than fixed-roof tanks and therefore accumulate less sulfide scale, but the floating roof is exposed to air when the oil level is very low.

The sulfide is probably ferrous sulfide, Fe S, a black powder, and it combines with the oxygen of the air to produce ferrous sulfate:

$$Fe\ S + 2O_2 = Fe\ SO_4 — 198.2$$

or at higher temperatures:

$$2\ Fe\ S + 3\text{-}1/2\ O_2 = Fe_2\ O_3 + 2\ SO_2 — 294.14.$$

The presence of ferrous sulfate in the debris of ignition has been confirmed.

The finely divided state of the black sulfide powder is probably the reason for spontaneous ignition. Even pure iron, when in a finely powdered form, ignites. The heats of formation of the several elements involved are:

Material	H at 18° C. K. cal. per mol
FeS	—23.1
$FeSO_4$	—221.3
Fe_2O_3	—198.5
SO_2	—70.92
O_2	zero

These figures (Perry—Chem. Engs. Handbook, McGraw-Hill Book Co., Inc., N. Y.) were used in computing the reaction heats shown above. These mean that the heat liberators at 65° F. (18° C.) are 4,050 B.t.u. per pound ferrous sulfide when burning to ferrous sulfate, and only 3,020 B.t.u. when burning to ferrous oxide.

Gunite Linings

How are gunite linings to vessels applied? We want to know the details, not a general discussion.—F.R.P.

THE details of applying gunite linings to tanks was completely discussed in the August 1948 issue of Corrosion (official publication of the Natl. Assoc. of Corrosion Engineers, Southern Standard Building, Houston). The practice described is that of Humble Oil & Refining Co. in its Baytown refinery for protection against sulfide corrosion.

The guniting of a tank is accomplished in three separate operations. These consist of preparation of the surface, installation of the reinforcement, and application of the gunite.

The final cleaning of the tank in preparation for guniting consists of sand-blasting to bare metal. It is common practice to sand-blast new tanks to remove mill scale. The application of reinforcement to the bottom shell and roof of a tank differs somewhat with each portion of the tank. The reinforcement for the bottom of the tank usually consists of 0.25-in. steel rods placed on 18-in. centers. Ten-gage steel mesh, 3 by 3 in., is placed over the rods and tied at the corners of the squares formed by the 0.25-in. rods with 16-gage wire. As the gunite is applied, the reinforcement is raised so that it will be at or near the center of the layer of gunite.

The reinforcement on the shell consists of 0.25-in. rods placed vertically with a horizontal spacing of 18 in. These rods are then tack-welded to the shell on 18-in. centers and are bent away from the shell about 0.125 in. between each weld. Ten-gage wire mesh is placed over the rods and ties on 9-in. centers with 16-gage wire. Reinforcing is cut along the edges of the door-sheet to facilitate removal of the door sheets.

Roof reinforcement consists of 0.25-in. rods tack-welded on 15-in. centers. These rods are placed parallel with a maximum spacing of 15 in. Ten-gage steel mesh, 3 by 3 in., is placed over the rods and is tied to the rods on 6-in. centers with 16-gage wire. The rafters and other structural members are covered with wire mesh, 3 by 3 in., which is tied in place with 16-gage wire. The structural members of new tanks are wrapped with wire mesh before the roof plates are installed.

A gunite lining consists of one part cement and three parts sand and is usually applied with a Type N-1 cement gun. Clean washed sand, with a nominal moisture content, is used. A standard brand portland cement is used. The gunite is applied to a 1-in. minimum thickness on the shell, roof and structural members, and to a 2-in. minimum thickness on the bottom.

The sequence of applying gunite is from the top of the tank to the bottom. The work is usually done from floats which necessitates filling to tank with water and withdrawing it as the work progresses. The gunite lining is usually cured by keeping it moist for a minimum of 48 hours. In some cases, steam may be admitted to the tank to facilitate curing.

The cost of applying a gunite coating is in the order to 50 to 60 per cent of the cost of a new tank. The application of gunite coatings to a tank is justified on the basis that they at least double the life of a tank. Normally, it is expected that gunite linings will more than double the life of a tank. The maximum life of such coatings in sour-crude and sour-distillate services has not been established.

Pump Suction

Can you outline for me or direct me to information on how to calculate the suction head required for a reciprocating circulation pump on a naphtha rerun unit?—W.W.B.

THIS question has been discussed exhaustively in The Oil and Gas Journal. Refiner's Notebook No. 155 (August 2, 1947, p. 93) entitled, "Suction Lift of Pumps" discusses the general situation with respect to the vapor pressure of the liquid, the kind of pump, and the entry losses. The special situations of "Vacuum and Close-Clearance Pumps" is discussed in Notebook No. 159 (August 30, 1947, p. 103) and of "Priming Centrifugal Pumps" in Notebook No. 156 (August 9, 1947, p. 111). Finally, approximate suction lift or head curves were published on this page in 1943 (July 29, p. 234, and August 12, p. 68).

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FOR GENERAL SERVICE, the Mission Silver Top Valve with the replaceable wear-taking bushing is unquestionably the most economical valve on the market to operate.

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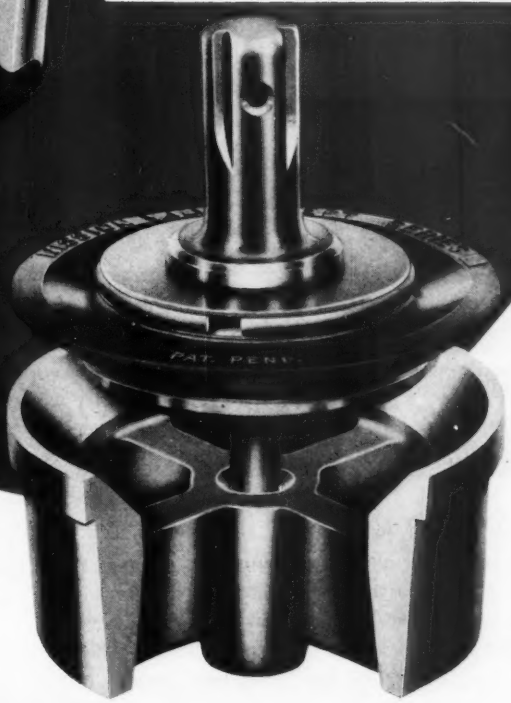

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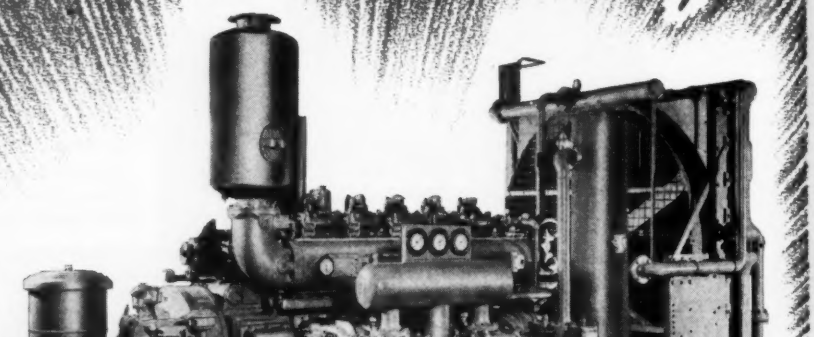

Clark Bros. MA-6, 225 H.P.
Midget Angle Packaged Compressor Unit

Young-Happy coolers set the pattern for...

▶ PACKAGED PORTABLE COMPRESSOR UNITS

One of the major problems in the development of completely packaged portable compressor engines was *adequate cooling*. The HAPPY Company engineers and representatives of the Young Radiator Company were called upon to design suitable air-type cooling. Problems such as limited space, low fan horsepower, rugged construction, and at the same time maintaining extreme flexibility, were encountered. The installations required jacket water and lube oil cooling, and at times gas intercooling, often involving FOUR SERVICES to be cooled by one fan.

For any air-cooling problem consult with "HAPPY" engineers. Twenty-eight years of experience serving the Petroleum Industry gives our engineers a background of experience to serve you better.

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Wichita	Kansas
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Great Lakes Expansion Program

(Continued from page 93)

economists and statisticians predicted in 1945 that it would take 8 to 10 years for domestic demand to pass the wartime peak. Actually the 1947 demand was 11 per cent greater than that of 1945.

To gain increased line capacity quickly, within a few weeks in 1947 presented a problem which was solved by the use of war surplus aircraft engines. For such engines it was necessary to have more than 600 hp. and a built-in cooling system, permitting operation without a large investment in auxiliary equipment. The type of engine selected by Great Lakes was a 12-cylinder, V-type, liquid-cooled engine originally designed for more than 1,000 hp. For the first time in pipe-line history, such engines were successfully converted to prime movers.

Since they were put in operation in the last quarter of 1948 at 12 additional secondary stations they have enabled the company to move several million barrels of products that otherwise could not have been handled. In the first quarter of 1948, these 12 secondary stations allowed Great Lakes to transport 1,084,952 bbl. of products above the amount that could have been pumped by primary stations alone.

Wherever natural gas is available, these Alison units have been converted to use it, with the result that cost of natural gas operation is one-ninth that of premium gasoline. Gas is injected under constant pressure into the supercharger, avoiding carburetion.

The 1947 secondary-station unit consists of an Alison engine, speed increaser gear, and Bingham centrifugal pump all mounted on a steel skid of heavy H-beam construction, 22 ft., 10 in. long and 6 ft., 4 in. wide, weighing 10 tons, mounted on a concrete base within a temporary building of galvanized steel. Interior of the engine room is covered with acoustical material to deaden mechanical noises. A fire wall separates engine and pump room.

Auxiliary equipment for the gasoline-operated Alison engine secondary stations includes: electric-fuel booster pump for starting; engine control panel with tachometer and gages for supercharger pressure, lubricating oil and coolant temperatures, and carburetor air temperature. On the panel there are also miscellaneous switches. In discussing unique pumping installations it is appropriate to mention that extensive use is made of conventional stuffingboxless pumps for serving storage tanks. On the entire system there are 144 stuffingboxless pumps: 114 Byron Jackson and 30 Bingham.

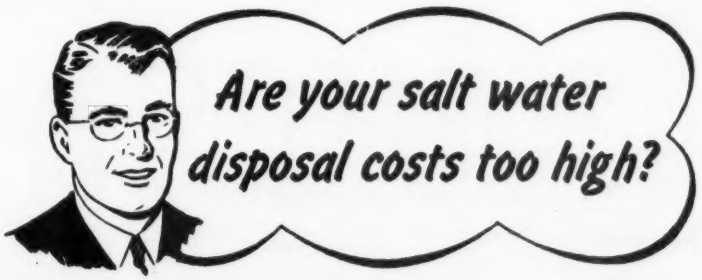
Swing Piping Connections

Swing connections with Unibolt couplings have been devised by Great Lakes engineers to insure that transfers from lines to tanks and vice versa may be made directly without intermediate manifold piping which would induce contamination. Each tank has a separate line laid above ground to minimize corrosion and avoid confusion.

Another example of swing-type connections is seen in the pantograph piping of the loading machines at terminals of the northwest line extending from Kansas City via Sioux City to Grand Forks.

Terminal Loading Machines

The "loading machine" specially designed for the northwest line is the greatest departure from conventional terminal facilities. This unusual structure for loading transport trucks avoids many of the bad features of the usual type of loading rack. The loading machine increases the speed of loading and affords safer conditions for the operator. It has been designed to enable the operator to have at his fingertips instant control over the loading of a maximum of nine grades of products.



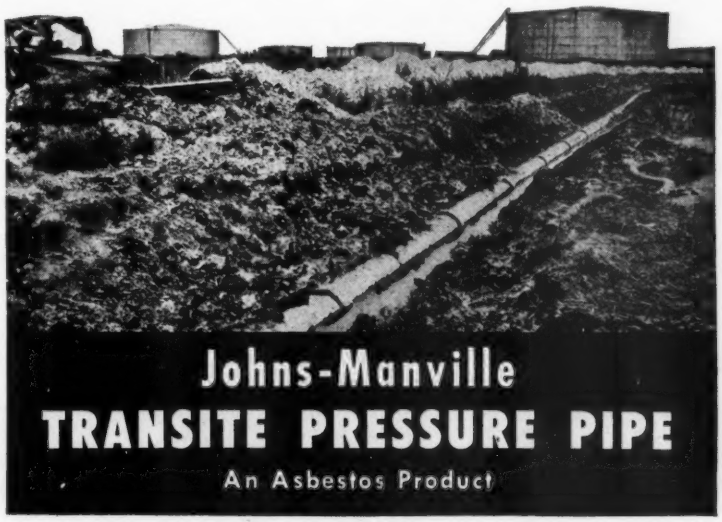
HERE'S HOW TO CUT PIPE REPLACEMENTS

There's no need to pay out good money for frequent pipe replacements in your salt water disposal lines—not if you put Transite Pipe on the job!

A Johns-Manville trade-marked product, Transite Pipe is made of asbestos and cement combined by a special process that makes it strong, durable and highly resistant to corrosion. It successfully resists the action of salt water on the inside, corrosive soil on the outside, thereby cutting costly pipeline replacements.

You get other advantages, too, with Transite. Light in weight, it is easy to handle. Most sizes can be unloaded and lowered into the trench without mechanical handling equipment. And Transite's factory-made Simplex Couplings speed assembly . . . provide tight yet flexible joints that permit laying the pipe around curves without special fittings.

Get further details about Transite Pipe by writing to Johns-Manville, Box 290, New York 16, N.Y.



At the center of the loading machine, there are series of pantograph piping which may be moved up and down and back and forth to reach tank truck domes. The loading platform, on which the operator stands, is made with two walkways between which there is an open space over the truck domes. This loading platform rests on four hydraulic plungers installed beneath the roadway. When a transport truck pulls into the loading stall, this platform is at its maximum height. The operator presses a button lowering the platform to a level where he can easily and safely handle loading operations.

The tank-car loading rack and motor-transport loading machine are interlocked, but the electric control panel at each point operates on separate relays to take care of the starting and stopping of the tank motor pump when both are loading from the same tank. This arrangement prevents one operator from stopping the pump when the other has not completed loading.

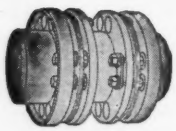
Construction of the loading machines was carried on under the handicap of wartime shortages. In many instances, pipe and fittings were heavier than intended and more expensive to install than normally. It will take time to determine whether normal investment in these machines above the cost of other facilities is justified.

THOMAS Flexible COUPLINGS

ALL METAL

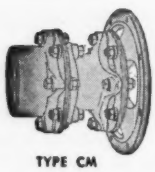
SPECIFIED WHEREVER 100% DEPENDABILITY IS DEMANDED

Refiners specify Thomas "Flexible" Couplings for PUMPS, COMPRESSORS, COAL PULVERIZERS, COOLING TOWERS and GENERATOR SETS.



TYPE DBZ-C

Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.



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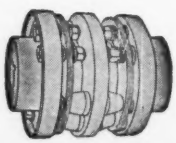
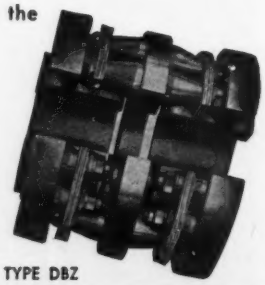
Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.



TYPE DBZ-B

In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.



TYPE DBZ

Thomas Flexible All-Metal Couplings Have No Wearing Parts. BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.

NO LUBRICATION IS REQUIRED!

Write for the new Engineering Catalog

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Barnsdall Pump Station

Prime movers at Barnsdall are four medium-speed turbocharged diesels connected to a speed increaser with a flexible coupling to eliminate vibration. Each of these four units consists of a 810-hp. at 600 r.p.m., American Locomotive Co. engine driving through Falk (6 to 1 ratio) gears a six-stage 6-by-8 Byron Jackson centrifugal pump. An acoustical panel ceiling lowers the sound level of the station. Lghts are flush mounted to facilitate housekeeping.

Engine exhaust generates steam in a special boiler which heats the building through radiating coils across which air, fed by a blower, is carried through ducts to ceiling diffusers to heat the building.

Terminal Functions

By motor transports and tank car, products move from company-owned terminals to destinations throughout Iowa, Wisconsin, Minnesota, and North Dakota; most of South Dakota and Nebraska; and parts of Kansas, Missouri, Illinois, Indiana, and Michigan: a total of 11 states. From the company's 14 distribution terminals deliveries are made to 57 companies, 18 railroads, and 564 truck lines to reach 2,284 destinations. Shipments over the Great Lakes lines are made by 16 companies from 21 refineries. On the average 80 per cent of the entire traffic of the company originates south of Kansas City.

Bank-Like Disbursements

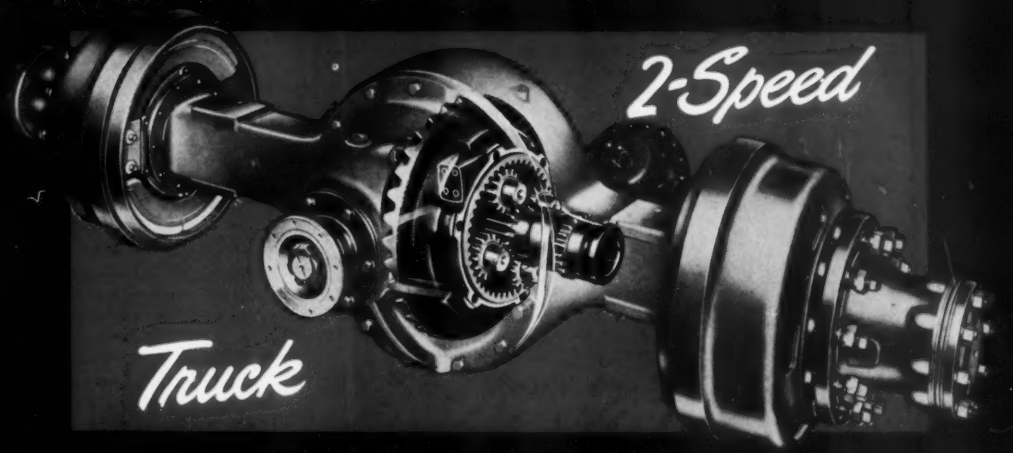
At distribution terminals the company assumes functions similar to those of a bank, inasmuch as it accepts responsibility for disbursement of the products which the shipper has deposited at the point of origin. The shipper instructs the pipe line when, where and to whom disbursement shall be made. All financial loss incurred in the loading of products and for the loss of volume in the line movements is absorbed by the pipe line.

A meteorological consultant twice a week predicts weather conditions which affect product movements. By his long-range forecasts it was possible this year for the company to prepare for an early dry spring. Daily and monthly loading volumes at delivery terminals fluctuate depending largely upon the weather and its effect on the use of gasoline for transportation and on consumption of burning oils for heating.

On the tenth of each month, Great Lakes' shippers indicate the nature of their shipments for the following month. Shipping schedules are then devised so as to provide for large continuous movements, particularly important for handling the heavier, higher-viscosity distillates.

The Kansas City control laboratory for the system is supervised by the chief chemist. Four inspecting field chemists, three outside of Kansas

EATON



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Stand Up Longer Because Axle Housing Deflections Can't Affect the Planetary Gears

The planetary gears of the Eaton Axle are self-aligning under load. This means that they are not affected by distortion of the axle housing. Improper tooth contacts are, therefore, minimized. This exclusive Eaton advantage results in lower upkeep expense and longer axle life. See your truck dealer for complete information.

MORE THAN A MILLION EATON 2-SPEED AXLES IN TRUCKS TODAY

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DYNAMATIC

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Drawworks Brakes

Provide Perfect Control without Friction or Wear

The Dynamatic brake consists basically of an iron armature drum, rotating through a magnetic field produced by electro-magnets. Eddy currents produced in the drum exert a pull on the stationary electro-magnets. This braking action depends upon the amount of current passed through the field coils. The higher the current value, the higher the torque developed in the brake. The small amount of current required is readily available from ordinary lighting plants.

THE Dynamatic electro-magnetic drawworks brake provides a braking effect which is variable and controllable through a range from 800 rpm to a drum speed slow enough to set slips on the heaviest strings of drill pipe or casing, without the assistance of the friction brake. Mounted similarly to the hydraulic type brake, the Dynamatic drawworks brake is comparable in size and weight. Energy absorbed by the brake is converted into heat, and dissipated in the cooling water. Remote control at the driller's position permits ease and speed of operation.

Outstanding characteristics of the Dynamatic brake are high torque at low speeds, and the complete absence of friction or wear, except on bearings, which have been designed oversize to permit continuous operation for years.

The Dynamatic brake is readily applied to practically all drilling rigs.

Sales Representatives: **GRIBBIN AND BAYLOR** Los Angeles • Houston • Fort Worth

DYNAMATIC **CORPORATION** • KENOSHA, WISCONSIN

Subsidiary of **EATON MANUFACTURING COMPANY** *Cleveland, Ohio*

General Offices: CLEVELAND, OHIO. *Plants:* CLEVELAND • MASSILLON • DETROIT • SAGINAW
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City, make tests of each shipment before it is accepted to make certain it meets all points of specifications. With the exception of Kansas City, these tests are made by company chemists in the refiner's laboratory. At each of the distributing terminals there is a completely equipped laboratory where tests are made of the products as they are received and again before they are loaded to ascertain that they conform to specifications.

The chief chemist makes certain that all testers are using the same technique and that equipment is standard.

On each field sample taken, the Kansas City laboratory runs a check test on the tetraethyl lead requirements to determine whether the antiknock engine used is operating in the same manner as the one at Kansas City. Regular test checks are also run in the control laboratory for comparison with results in the field and at terminals. Testing methods are those approved by American Society of Testing Materials, Federal Standard Stock Catalog, and Ethyl Report Numbers. In short, before being loaded, gasolines must be tested, blended, and tested again.

Forecasting and Accounting

Working closely in association with the terminals are the forecasting and stock accounting groups of the general office at Kansas City. A calculation is made by the stock section of the amount of product being pumped into a terminal each day. This amount is divided into allocations to each shipper. This information telegraphed to the terminal authorizes that it make stock available at midnight to several shippers in the amounts listed.

Terminals maintain a perpetual inventory of each shipper's stock. Each terminal also compiles, from its midnight tank gages, a physical stock record which is given by telephone to the dispatcher at Kansas City. Shippers receive a daily report showing their available stocks and stocks in transit.

The policy of some shippers in virtually giving blank checks on their stocks to hundreds of individuals, results in transport trucks often leaving a terminal without loads in their tanks whenever demand exceeds supply.

On circular charts, dispatchers keep an accurate record of line movements noted through hourly readings reported from all pump stations and receiving terminals as well as through gage readings of tanks from which shipments are being received into the line.

Tank-Truck Loading

The average time between the truck driver's entrance into the terminal with his truck order and his departure with bill of lading is 30 minutes which may be divided as follows: (1) 3 or 4 minutes for checking in; (2) approximately 25 minutes for driving to and from loading rack and for loading operations; and (3) 1 to 2 minutes to check out.

At the loading rack safety precautions are observed by grounding the transport by a bonding cable. Compartments are inspected and drained. On presenting the truck order to the loader, the bill of lading is inserted in the printer and the opening meter reading is recorded.

When the compartments are about half filled, a temperature reading of the product is noted. When the truck-tank compartment is filled, a thief stick to test for water content is submerged to the bottom for at least 10 seconds.

After the transport is loaded, the bill of lading is removed from the printer and the temperature and tank number are recorded by the loader who signs the form. When required, seals are attached to transport dome covers. With full pump capacity a tank car can be loaded in 15 to 20 minutes.

Des Moines Terminal

Des Moines is one of the vital locations of the system for accumulation and reassignment for terminals to the north and east. To perform transfer and distribution service, the company has the largest tank farm on the system at Des Moines, 35 tanks with a total capacty of 1,028,100 bbl. During day and night operations for 308 loading days in 1947 the Des Moines terminal loaded a daily average of 126 transports, 9 tank cars, with 679,691 gal. Truck loadings at Des Moines terminal in 1947 were 72 per cent of traffic handled there.

Northwest System

The northwest line of Great Lakes is an outstanding example of postwar advanced products terminal design to achieve a high degree of flexibility in operation.

Sioux City facilities are representative of the new pump stations and terminals constructed during the company's expansion program begun in 1945 immediately after V-J Day and completed in 1947. Included in the program was the building of the entire line northwest of Kansas City to Grand Forks. All terminals are new with the exception of the one at Omaha, originally on the former line from Osceola, Iowa, now discontinued.

Large initial investment in some of the features of the northwest system is warranted by economies to be obtained in a long-period operation. Buildings of brick-and-tile construction are virtually free of maintenance expense. Utility and good architectural appearance are combined. Acoustical panel ceiling with lighting fixture flush mounted reduce housekeeping costs. A construction feature is the "cold break" installed at all

A HANDSOME CHRISTMAS GIFT!

The Texan

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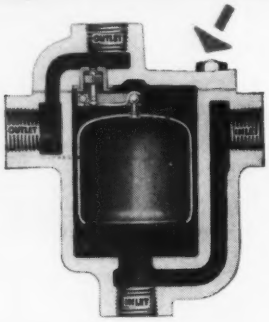

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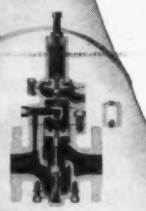

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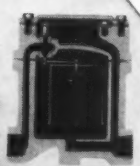

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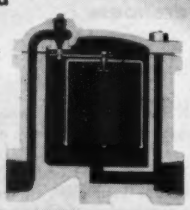

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buildings, consisting of a trench a foot wide and a foot deep located inside the foundation under the floor. This is filled with asphalt, serving as insulation against cold. The individual heating plant utilizes engine waste heat in conjunction with a fuel-oil burner unit similar to the one at Barnsdall.

Pumping at the northwest primary stations is done by Great Lakes' standard units consisting of Byron Jackson centrifugal pumps driven by American Locomotive Co. diesel engines.

Departing from usual practice, heat exchangers for both engine coolant and lubricating oil are located vertically underneath the floor. This eliminates need for draining when not in use in cold weather. Terminals on the new line are located at 100-mile intervals.

At each terminal, structures consist of the following: (1) service building housing main office, superintendent's office, laboratory, furnace room, rest rooms for employes and truckers; (2) boiler house for producing steam in cold weather to thaw transport-truck outlet caps and dome covers; and (3) at Sioux City and Alexandria a building for tetraethyl lead tank and dry dye eductor unit.

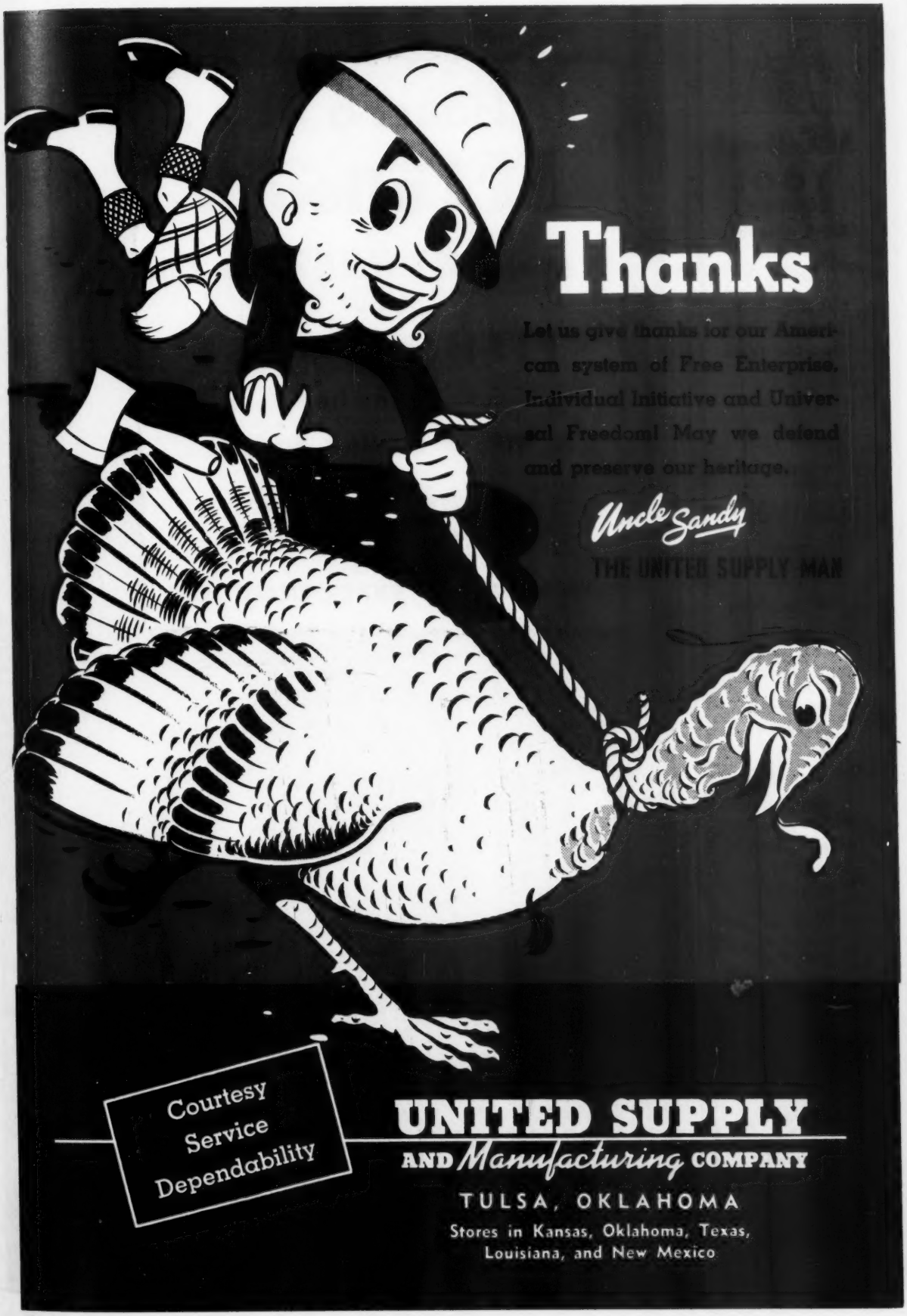
Working tanks are relatively small, the largest of three working tanks being of lifter-roof type with 30,000 bbl. capacity. To each of these there is connected a series of cone-roof tanks in a closed vapor-recovery system.

Individual incoming and outgoing lines of each tank, suction pump and manifolds, together with the tank itself, form an isolated unit which functions independently of any other tank. Two or more tanks containing the same grade can be readily connected with or disconnected from a single delivery facility to meet varying requirements.

At an end room in the pump station there is a swing arrangement, similar in principle to those on the manifold units. Thus an incoming stream may be switched directly to the receiving line of any tank. Individual delivery lines from each tank go direct to loading units.

A line for lead and dye is usual for terminal tankage. As soon as such additives have been introduced into a tank that is to be blended, it is closed off. Circulation of an additive within the tank is accomplished by means of the tank pump and a spider arrangement within the tank. Within 3 hours any tank may be completely circulated.

Robert A. Henderson, Socony-Vacuum Oil Co., Inc., has been elected president of the Metropolitan Traffic Association of New York. Henderson has been associated with the company's traffic department for the past several years as traffic assistant.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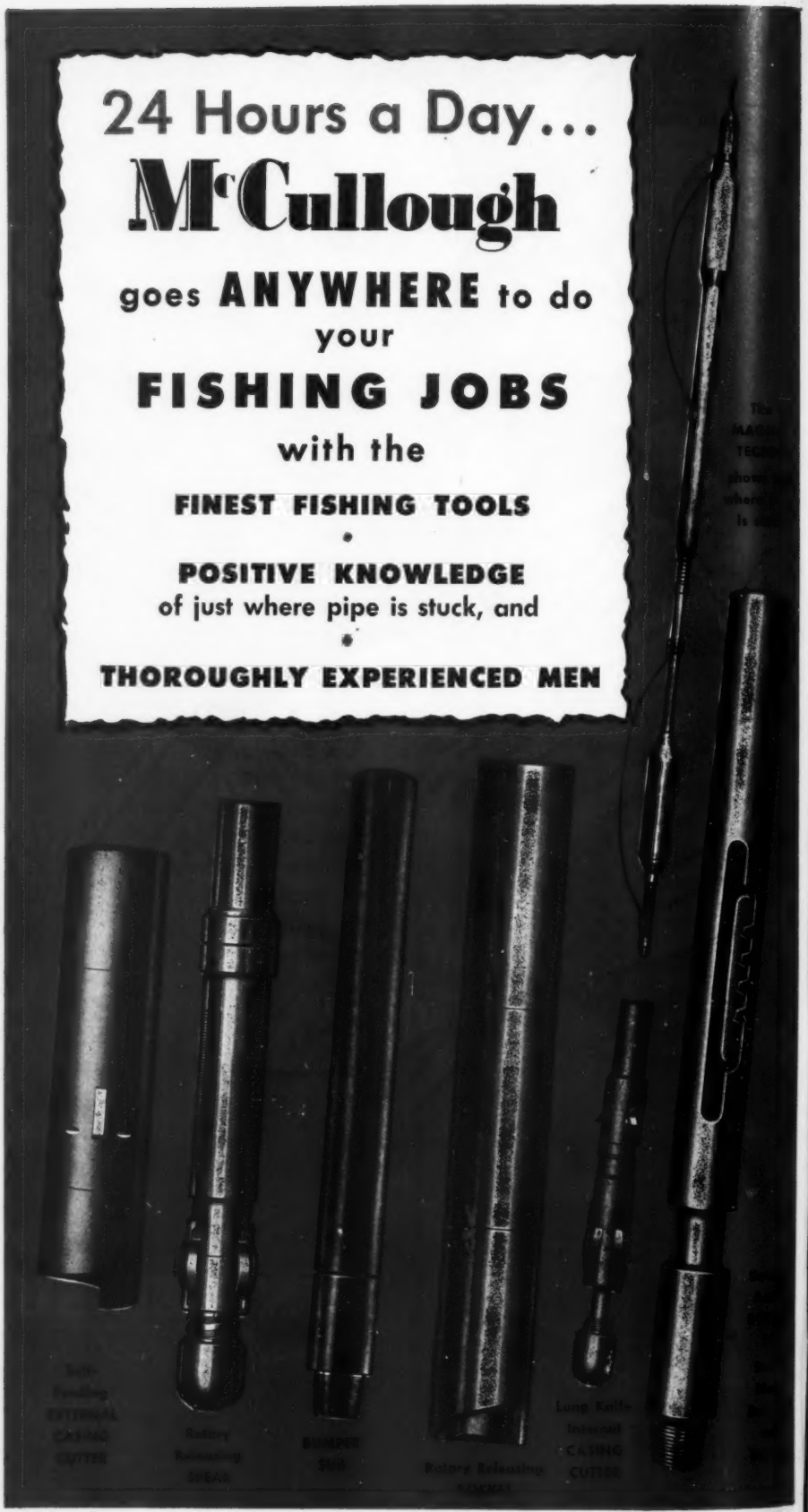


ENGINEERING *fundamentals*

Methods of Obtaining Porosity

POROSITY is defined as the percentage by volume of pore space within a reservoir sample. Its measurement requires determination of two quantities on a core sample; the pore volume and the bulk volume. Usually, the two measurements are made independently although methods exist where simultaneous calculation is possible.

The measurement of pore volume by saturation is a direct method. The core sample, after cleaning, is evacuated and saturated fully with a suitable liquid. It is weighed both in the dry state and saturated state. Difference in weight divided by density of the saturant gives pore volume directly. A liquid of low volatility should be used and full saturation must be obtained. This is assured if the liquid is one which wets the core sample. However, use of fluids which give an internal swelling of the matrix material should be avoided.

A modification of calculation using the saturation method is to employ the buoyancy principle. The saturated core can be weighed in air and can then be weighed suspended in a vessel of saturating liquid. Using Archimedes' principle, the porosity can be shown to be expressed by the weight of the saturating liquid within the sample divided by the loss in weight of the saturated core when suspended in the saturating liquid. A bulk volume does not have to be made independently.

The measurement of pore volume by the injection of mercury is a rapid technique. The method is based upon the measurement of that volume of mercury which can be injected into the core sample under high pressures, it being assumed that the residual air would be compressed to a negligible volume and that the mercury would, therefore, essentially fill all pore space. However, mercury does not wet the surface of core samples. Hence, the injection of mercury is limited to a value somewhat less than 100 per cent by the capillary forces involved even under considerable pressure. According to the latest capillary theories, a porosity by means of mercury injection would give that pore volume available for hydrocarbons only. In other words, it does not measure that pore space which would be occupied by connate water.

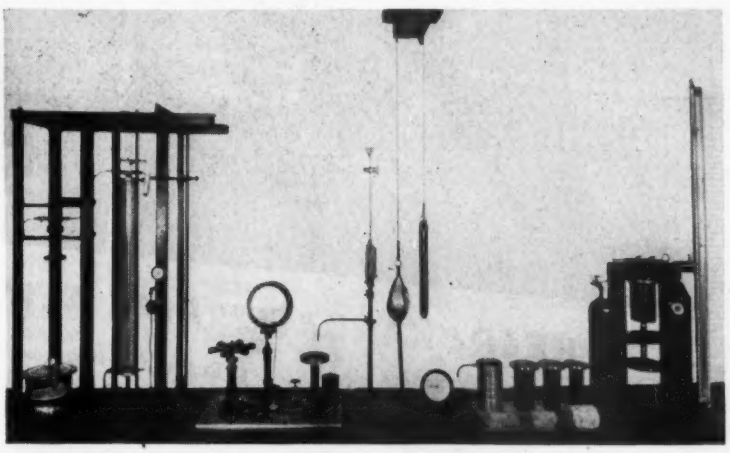
Boyle's Law

Another method is based upon Boyle's law. The gas under pressure within a core sample is expanded to a lower pressure. The initial pressure, the pressure after expansion, and volume after expansion are measure. Process is done at constant temperature and simple calculation gives the volume of gas at the original pressure, which is the pore volume. Actual operating equipment makes use of chambers larger than core samples so that corrected formulas are necessary. The process then becomes a gas expansion from a known chamber volume less the sand-grain volume of the core sample. A disadvantage of this method is that it must be run at constant temperature and may give appreciable error because of the adsorption of gases within the core system. Bulk volume must be determined independently when using this method.

Still another method of determining porosity is the Washburn-Bunting method. In this method the air which is within the sample is evacuated from the core sample and measured. Evacuation is performed by raising and lowering a mercury leveling bulb. The air which is removed is replaced by mercury. Several expansions are necessary, and in effect the entire amount of air cannot be expanded from the core. Here also bulk volume must be obtained independently.

The bulk volume of core samples is usually obtained by displacement or by measurement of core dimensions. Determination by displacement is accurate where none of the displaced fluid can enter the core and where there are no air bubbles adhering to the core sample to give erroneous volume readings. When porosities are determined on the usual routine cylindrical plug samples, a measurement of the plug diameter and length will allow accurate calculation of the bulk volume.

Other methods of measuring porosity involve breaking the sample to sand grains. These are not used to much extent because of their cumbersomeness.



Three porosimeters: At left is a Boyle's law type for small samples. Right: Same, but handles full-size cores. Center: Washburn-Bunting type

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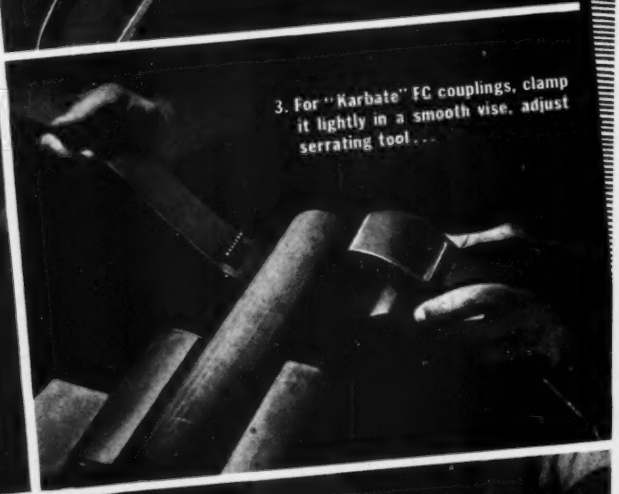

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Storage Tanks

COST INDEXES, 1946 = 100

	Tank steel*	Composite steel*	M.&L. tanks†
1924	86	93.5	78
1926	76	86.5	71
1928	76	81.8	70
1929	78	85.5	72
1930	68	78.6	65
1931	65	73.0	63
1932	63	69.5	59
1933	65	69.0	60
1934	72	76.5	67
1935	73	77.0	68
1936	75	79.0	70
1937	89	94.6	82
1938	88	91.7	82
1939	85	86.0	80
1940	85	85.7	80
1941	85	85.7	81
1942	85	85.0	83
1943	85	85.5	86
1944	85	84.5	86
1945	89	90.2	91
1946	100	100.0	100
1947	117	117.0	117
1948 est.	150	136.0	150

*U. S. Department of Commerce—Stat. Abstracts of the U. S., 1947—and Summary of Current Business, Bureau of Foreign and Domestic Commerce.

†Based on tank steel index and refinery labor index, in the proportion of 30 per cent labor.

STORAGE tanks are a major item of cost in a refinery, but the amount of storage varies widely. In large refineries which produce a full range of products, storage may amount to 100 or even more barrels per barrel of daily capacity, whereas in small refineries or those that have an assured outlet for their products, storage may constitute only 40 bbl. per daily barrel of capacity. The cost of such storage varies with the size of tank required by the refiner's market outlets, but in general ranges from $1.25[6] to $3.54[6] per barrel of storage (1948 prices). Thus, the cost of storage ranges from about $50 to even $354 (1948) per barrel of plant (daily) capacity. One refiner[7] indicates a cost for refinery rundown tanks of $1.50 per barrel (1948).

TABLE 1—CONE ROOF AND STANDARD A.P.I. TANKS[1,2,3]

(Not including foundations or paint)

Capacity (bbl.)	1946 costs, M. & L. ($/bbl.)
5,000	1.22-1.90
6,000	1.18-1.82
7,000	1.15-1.72
8,000	1.10-1.64
10,000	1.03-1.53
12,000	0.96-1.44
14,000	0.91-1.37
16,000	0.88-1.30
20,000	0.80-1.21
25,000	0.74-1.13
30,000	0.70-1.03
40,000	0.62-0.91
50,000	0.56-0.82
60,000	0.52-0.76
80,000	0.45-0.64
100,000	0.40-0.57
140,000	0.36-0.51

TABLE 2—SPHERICAL TANKS[1] (1946)

(Not including foundations or paint)

Capacity (gal.)	Material—cents per gal. 100 psi.	25 psi.	15 psi.
20,000	50-60	30-40	.....
50,000	30-35	20-25	.....
100,000	20-25	12-16	9-12
200,000	.....	.....	7-9
500,000	.....	.....	6-8
	Erection—cents per gal.		
20,000	10-21	6-14	.....
50,000	6-12	4-9	.....
100,000	4-9	2.4-5.6	2-4
200,000	.....	.....	1.4-3.1
500,000	.....	.....	1.2-2.8

The cost of erection of tanks in the field ranges from 20 per cent[1] to about 40 per cent[3] of the total installed cost shown in Table 1. With special alloys or steels, the fabrication and erection costs are much larger,[3] ranging from about 220 to 275 per cent of the basic price for the steel or alloy. The costs of Table 1 may be increased by about 5 per cent for full-penetration welding, and also 5 per cent for nonstandard (A.P.I. has standard dimensions) proportions of diameter to height. The spread in cost of Table 1 is due to different locations, labor costs, and fabrication costs, but also in part to differences in metal thickness. Thus, for welded field stock tanks the effect of metal thickness is to change the 1946 per barrel cost as:

100 bbl. (9-ft. 6-in. dia. by 8 ft.):	
10-12-12 ga.	$3.36
¼-⅜-⅜ in.	3.91
¼-¼-¼ in.	4.37
210 bbl. (10-ft. dia. by 15 ft.):	
⅜-10-10 ga.	2.28
¼-⅜-⅜ in.	2.77
¼-¼-¼ in.	3.05

Floating-roof tanks cost 10-18 per cent more[2] than the fixed-roof tanks of Table 1.

The cost of "guniting" tanks to protect them from corrosion is somewhat (1946) as follows:[8]

	Cents/ sq. ft.
Roof and structural steel	51
Walls or shell	47½
Bottom	44

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1. Happel, Aries and Borns, Chem. Eng., Dec. 1946.
2. Wolf, Oscar, Pet. Mech. Eng. (A.S.M.E.) 1930.
3. Fox, Lyle E., Chem. Eng., Aug. 1947, p. 100.
4. Anon, The Oil and Gas Journal, Feb. 11, 1943, p. 73.
5. Author's files.
6. Anon, The Oil and Gas Journal, Jan. 9, 1948, p. 184.
7. Plant Construction, Pet. Refiner, July 1948.
8. Newcomb, Kelly & Dixon, Pet. Refiner, Nov. 1942, p. 113.

No. 5 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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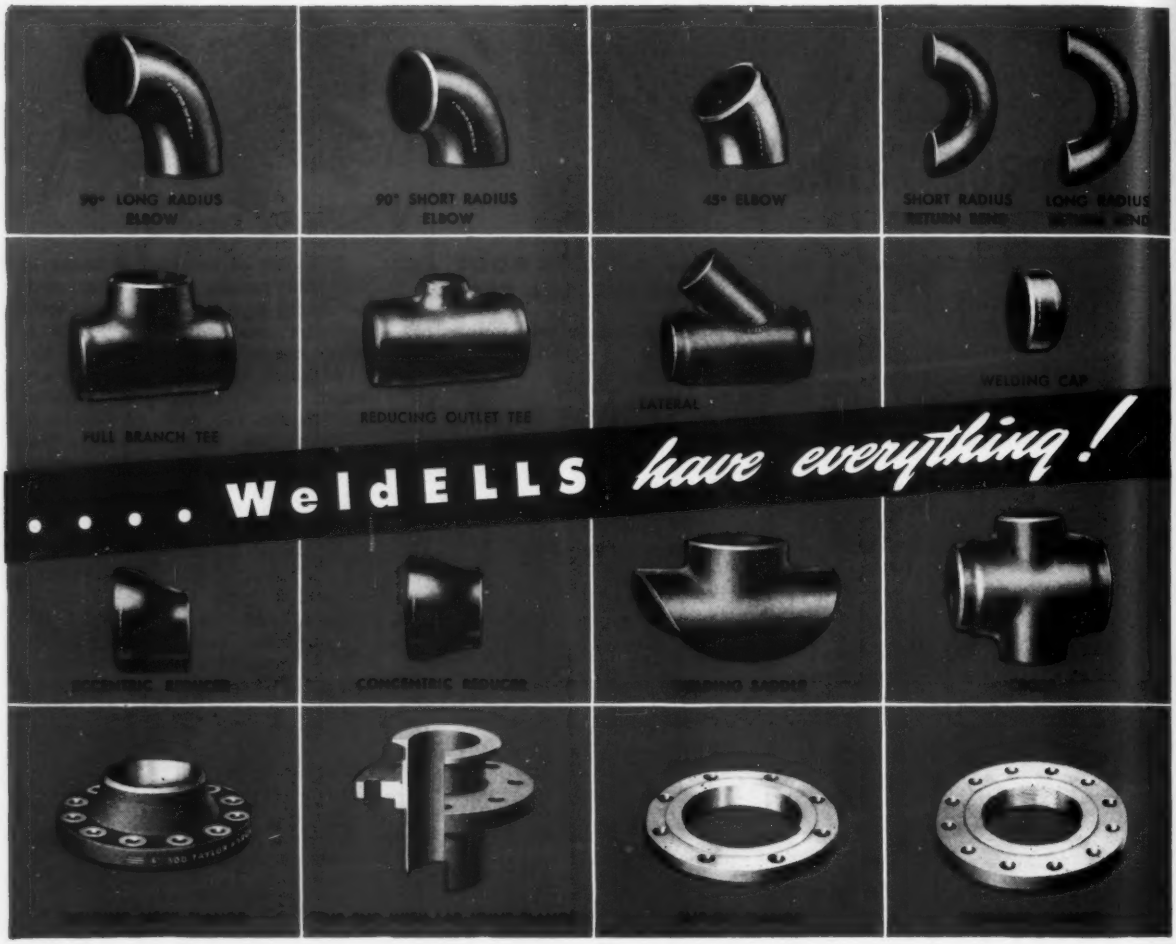

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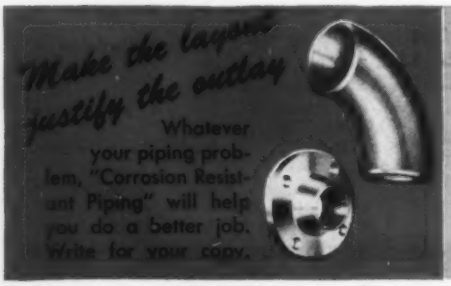
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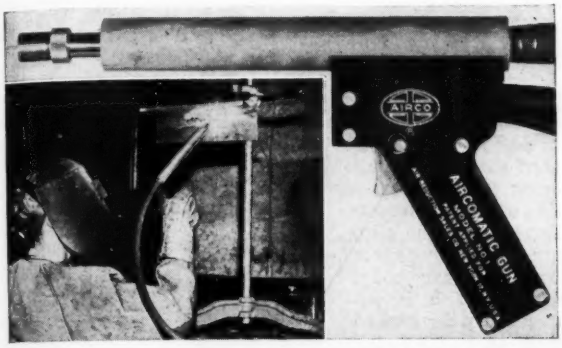
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by Craig Espy



(1) REVOLUTIONARY NEW WELDING PROCESS. Known as the "Aircomatic" process, may be used for welding heavy sections of aluminum and aluminum alloys at wire feed speeds ranging from 100 to 300 in. per minute. Essentially, process is a form of gas-shielded, metal arc welding but the conventional nonconsumable electrode has been replaced by a continuously fed, consumable wire. This wire is fed to the work through the barrel of a welding "gun." The filler metal carries welding current and an arc is maintained between the end of the wire and the work. Power is supplied from a standard d.c. welding generator and argon is used as the shielding gas. Application of the process to metals other than aluminum is now under development. *Air Reduction Sales Co.*

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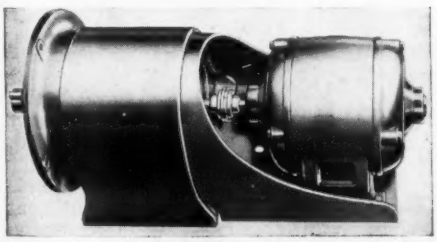
(2) ALL-STEEL MOTOREDUCER retains design features of original model but has all-steel housing with smooth contours and generous sections. This practically eliminates accidental damage. Housing is also lighter and stronger. Dirtproof and moistureproof seal protects gears and bearings against contamination of lubricant by moisture and dirt. Conservative horsepower still retained assuring long trouble-free operation. Line includes horizontal and vertical units for floor, wall, or ceiling mount. Basic unit can be converted to right-angle, V-belt, multispeed, low ratio, and many other adaptations. *Falk Corp.*



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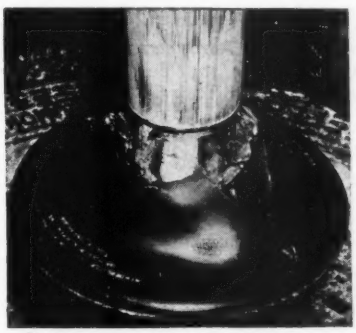
(3) FULL FLEX PIPE WIPER fits snugly around the pipe, but has sufficient flexibility to pass tool joints, drill collars, and protectors of greater diameter than the pipe, including bit. Consists of two layers of abrasive-resistant rubber joined at the circumference around a steel reinforcing ring. The center of each layer is cut out to suit outside diameter of pipe, and each layer is split at right angles to the other. Returns to normal shape and position immediately after passing any part of the string wider than the pipe. Made for pipe sizes from 2⅜ to 6⅝ in. inclusive and outside diameters of 15, 17, and 19 in. *Hinderliter Tool Co., Division of H. K. Porter Co., Inc.*



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(4) HIGH-TEMPERATURE LIFE LINE A-C INDUCTION MOTOR. Silicone resins for winding insulation and silicone grease for bearing lubrication make possible totally

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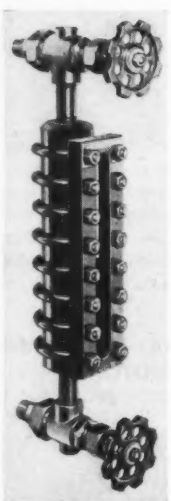
enclosed nonventilated motor in a 5-hp. 4-pole rating in same frame sizes as open motor of same rating. This permits reductions of as much as three frame sizes from present standard Class A insulated totally enclosed motors. Motor on left in illustration is 5-hp. 4-pole silicone insulated. The one on right is rated the same but is Class A insulated. Weight by using silicone is reduced from 250 to 145 lb. Height is reduced 3¼ in.; length 7¼ in. *Westinghouse Electric Corp.*

IT'S NEW CHECK IT

(5) AGATE FILTER TRAP separates fine sand particles from shale assuring clean flow of fluid. It is said to provide longer life, fewer emulsion problems, and less gas locking and surging. Contains 6,000 tempered agate balls which actuate with each stroke of the pump. As fluid passes through filter, fine sand attached to small particles of shale is separated by grinding action of marbles. Gas travels upward to gas chamber and escapes through ball check valves to outside of tubing with each stroke of pump. Illustration shows gas escape valve, gas chamber, marble pack, and intake chamber. *Filter Trap Co.*

IT'S NEW CHECK IT



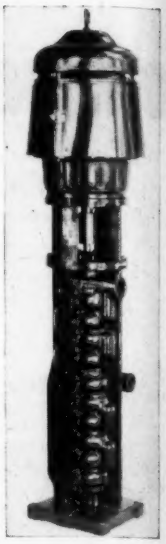
(6) LARGE CHAMBER GAGE gives accuracy of level reading said never before possible. Used in gaging liquids that boil where liquid fluctuates rapidly in the glass. Gage chamber built to such large diameter that effect of boiling action on liquid level is minimized. This allows close level readings. Gage is indicated for use on light end services, also valuable as a visual standpipe. Is of flat glass, reflex type. Made in sections up to any desired length. *Jerguson Gage & Valve Co.*

IT'S NEW CHECK IT

(7) CHEMICAL GAGE. Particularly suitable for chemicals and other viscous liquids which either corrode or clog the Bourdon tube of a standard pressure gage. Diaphragm is made of Teflon which satisfactorily resists practically all corrosive chemicals. Gage is supplied for vacuum and for compound ranges as well as for pressures as high as 1,600 psi. and for temperatures at the gage of 300° F. *American Chain & Cable Co.*

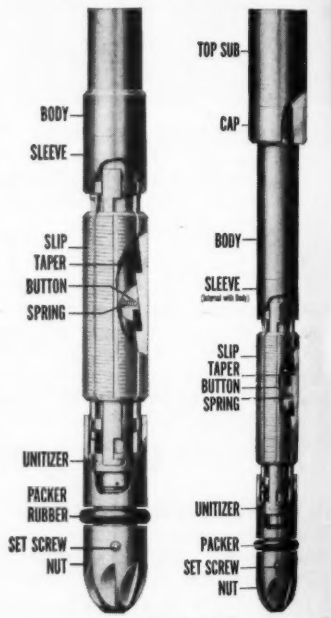
IT'S NEW CHECK IT

(8) LOW-COST HYDROPLEX PUMP. New member of manufacturer's line of standard pumps is suitable for water-pressure boosters and refinery service. Has inherent hydraulic balance. Radial forces are balanced out by staggered volute construction. Outlet of each stage diametrically opposite outlet of adjacent stages. This reduces pressure bending moment of shaft and possibility of extreme shaft deflection. Balance of axial thrust forces is achieved by opposed grouping of impellers. Standard sizes are 1½ by 2 by 5½ in. and 2 by 2½ by 6 in. Built-in even-stage combination from 4 to 16 inclusive for two-pole spreads. *Byron Jackson Co.*



IT'S NEW CHECK IT

(9) RELEASING AND CIRCULATING SPEARS. Utilize novel full-circle slips that contact virtually the entire inner surface of a long section of the fish. Inner circumferences of the slips are backed by tapers on the spear body. When a fish is engaged and upward pull is exerted the expansion strain is spread so evenly over so much of the inner surface of the fish that there is no distortion. In tests with hydraulic jacks and on trial runs in conjunction with jars, pipe has been pulled in two below the spear with no distortion of the fish at the point of engagement. *S. R. Bowen Co.*



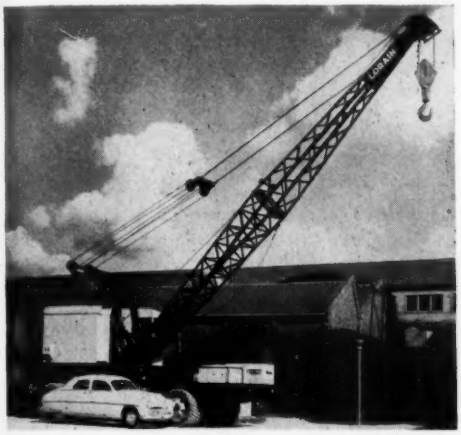
Patent Pending

IT'S NEW CHECK IT

(10) HYDRAULIC POWER UNIT for pipe-straightening machines speeds up straightening operations by eliminating hand pumping. Requires only one connection for installation. Unit incorporates many safety devices and all moving parts are away from the operator. Models available from 2,000 to 6,000 psi. Unit can also be used to power hydraulic presses or other hydraulic equipment. *G. T. Bynum Co.*

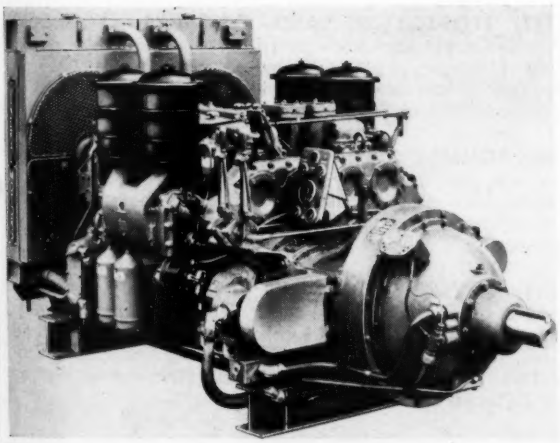
IT'S NEW CHECK IT

(11) GIANT LORAIN MOTO-CRANE. Makes possible the lifting and transporting of loads heretofore beyond the capacity of such equipment. This rubber-tired, two-engined moto-crane has a safe-rated lifting capacity, on outriggers, of 45 tons at 12-ft. radius. It is comprised of two basic components, the carrier, or rubber-tired mounting, which transports the unit from place to place; and the turntable, or revolving superstructure, which is attached to the carrier frame. Carrier has been engineered specially to serve as a mounting for heavy-duty crane lifting service and therefore departs from the ordinary motor-truck design in many respects. *Thew Shovel Co.*



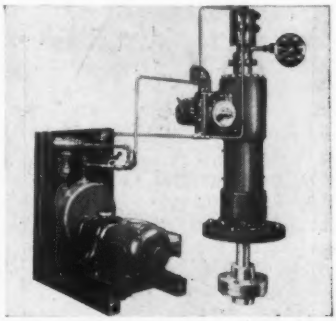
IT'S NEW CHECK IT

(12) TORQUE CONVERTER AND FLUID-COUPLING UNIT is suitable for either draw-works or mud-pump applications. Consists of four major elements, pump, turbine, and two stators. Produces torque multiplication of up to four to one. Integrated power plant occupies no more space than the same engine equipped with conventional clutch and power takeoff. Outstanding characteristic is its ability to pick up load with maximum lifting power and shift automatically from torque converter to fluid-coupling principal in the higher speed range. Combination is available in single 3, single 4, single 6, and twin four and twin 6 models having engine ratings from 75 to 300 hp. Complete package measures 106-5/32 in. in over-all length. *Detroit Diesel Engine Division General Motors Corp.*



IT'S NEW CHECK IT

(13) VARIABLE-SPEED HYDRAULIC DRIVES. System has motor integrated to extension shaft and special mechanical seal for pressure-vessel applications. Motors may be remotely located from pumps. Hydraulic circuit can also be arranged so that several motors are supplied with fluid pressure from one central pumping source. Speed is maintained by separate hydraulic control circuit operating on constant-pressure-differential principle through pilot valve. If constant-pressure differential is upset, pilot valve reacts to reposition proportioning of fluid to main hydraulic motor. Furnished in speed ranges up to 5,000 r.p.m. and in ratings from fractional to 125 hp. or greater. *Rockwell Mfg. Co.*

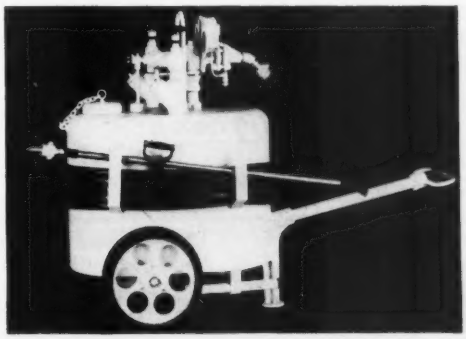


IT'S NEW CHECK IT

(14) DUALOCK TUBING ELEVATOR has double safety feature. Even when door is not locked, a positive acting safety latch, rotating with the lock, keeps tubing locked within elevator. Tubing can never drop even though door is open. Door lock has double-locking faces. Body of elevator is heat-treated, solid alloy-steel casting designed with four-to-one safety factor. Double safety features have been pretested under every field condition. *Regan Forge & Engineering Co.*

IT'S NEW CHECK IT

(15) HI-PRESSURE JET CLEANER. For fast and thorough cleaning of heat-exchanger bundles, cooling coils and most other types of processing equipment. Cleaner has a self-contained 50-gal. tank for a detergent, and a 50-ft. pressure-type hose and nozzle with operating controls. Only connections to a steam and a water line are required. Jet can be uniformly mixed with the desired amount of detergent. *Sellers Injector Corp.*



IT'S NEW CHECK IT

TRADE LITERATURE

(16) CHLORINE TECHNICAL MANUAL. Seventy-two-page manual, a sleek black and green, makes attractive addition to chlorine reference file. Designed for operators, technicians, and executives, manual presents charts, diagrams, and photographic illustrations concerned with production and handling of chlorine and several of its end products. *Pittsburgh Plate Glass Co.*

(17) ANALYTICAL INSTRUMENTS FOR SCIENCE AND INDUSTRY. New general catalog briefs all instruments designed by this company. Catalog is divided into two sections; mass spectrometry and static-dynamic measuring and recording. *Consolidated Engineering Corp.*

(18) INDUCTION MOTORS. New bulletins on heavy-duty squirrel-cage induction motors show cutaway and sectional drawings, details of welding frame construction, protective design, modern bearings and multilayer insulation. *Electric Machinery Manufacturing Co.*

(19) OIL-FIELD MOTORS. Bulletin discusses motors to use on pumping units. Features better ventilation, insulation, bearings, construction, and engineering service. Tables show standard dimensions. *Robbins & Myers, Inc.*

(20) WELL SCREENS. Thirty-two-page catalog describes complete line of screens for wells from 2 to 36-in. diameter. Contains engineering data on use and installation. Shows how screen, tailor made for each installation, increases efficiency of well. *Edward E. Johnson, Inc.*

(21) ROSS SHELL-AND-TUBE HEAT EXCHANGERS AND ALLIED EQUIPMENT. Complete line may be seen at a glance in bulletin just published. Illustrations of each major item are supplemented by elaborate cutaways and interior views. *Ross Heater & Manufacturing Co.*

(22) LUBRICATED PLUG VALVE. Bulletin offers general catalog data, descriptions, specifications and prices on the units, parts and accessories. *Homestead Valve Manufacturing Co.*

(23) COMPLETE DIESEL-ENGINE LINE. Profusely illustrated booklet (24 pages) presents in design features, specifications and work capacities of this firm's diesel engines. Illustrations show the engines stripped, as well as with various attachments. Also carries performance charts. *International Harvester Co.*

(24) SURFACE CONDENSERS. Sixteen pages on condensers, built in sizes from 500 to 15,000 sq. ft. Includes data on condensate pumps, steam jet ejectors, duplex drainers, and air leakage meters. Also carries pressure-temperature conversion tables, charts, and condenser formulas. *Elliott Co.*

IT'S NEW ✓ CHECK IT

(25) HIGH-PRESSURE PUMPS. Eight pages show design and construction features this firm's pumps. Cutouts picture pump detail. Schematic drawings and specification tables given. *John Bean Manufacturing Co.*

(26) INSTRUMENT CATALOG. Revised 36-page catalog illustrates and describes in detail complete line of potentiometer pyrometers, embodying a phototube, a beam of light and a mirror galvanometer. This principle of operation is said to achieve greater accuracy and almost instantaneous response. *C. J. Tagliabue Corp.*

(27) FACTS ABOUT SIX-WHEELERS. Illustrated 20-page booklet traces development of six-wheel vehicles. Defines and discusses various types. *Timken-Detrot Axle Co.*

(28) MOBILE REPAIR SHOP. Six-page foldout bulletin shows advantages of completely coordinated and engineered repair shop on wheels. Unit features workbench, vise, high-lift hoist for emergency lifting, lathe compartment, air compressor, welding tanks, bending jigs, etc. *Couse Manufacturing, Inc.*

(29) MEAD HEVI-TRAILER. Pictures and operating information in 16-page bulletin show trailers at work in modern industry. Neck design of trailer permits fast, easy moving of heavy machinery without large investment in equipment. Also permits use of dump trucks in place of truck tractors. *Mead Machine & Iron Works, Inc.*

(30) L & N PNEUMATIC CONTROL. Air-actuated control system presented in a 24-page well-illustrated catalog. Enables users to obtain faster startup, smaller process swings, no process drifts, longer on-stream runs, faster recovery from upsets and shorter turn-around time. *Leeds & Northrup Co.*

(31) SLUSH PUMP PARTS. Twenty-four page bulletin describes and illustrates parts for slush pumps. Features and advantages of each part, and specifications are presented. Tells how to install and get maximum service from parts. *National Supply Co.*

(32) TEMPERATURE AND PRESSURE RECORDERS. Twelve-pages describe gas-filled recorders and recording pressure gages.. Illustrated by photographs and numerous line drawings. Tables give chart specifications. *Penn Industrial Instrument Corp.*

(33) SCRUBBERS AND COOLERS. Three-color bulletin on gas scrubbers and coolers, complete with diagrammatic sections, illustrations explaining both the multi-stage and single-stage scrubber and cooler. *Peabody Engineering Corp.*

(34) NEW STEEL BUILDING CATALOG. Catalog, 32 pages, describes in detail many types and applications of steel buildings easily assembled and erected from standized, mass-produced deep ribbed parts. Includes specifications and construction features. *International Derrick & Equipment Co.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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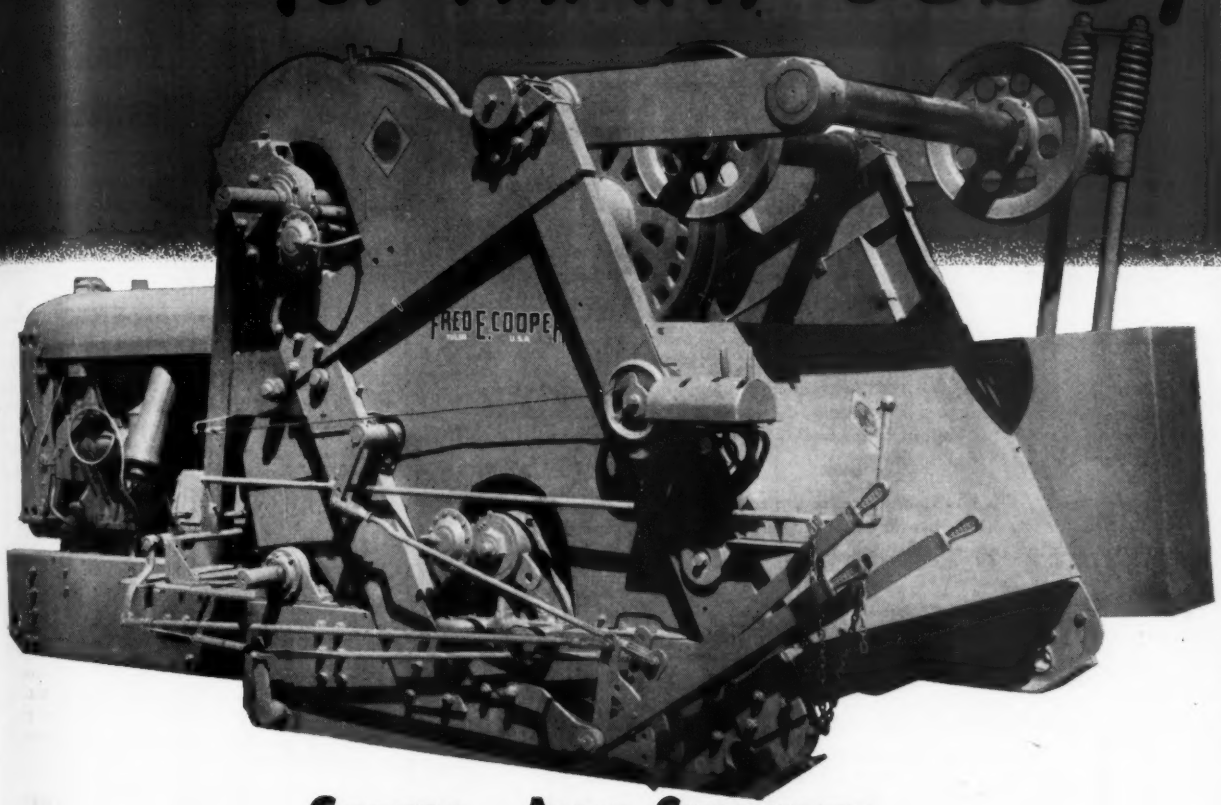

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The "cable tool" action spudder gives the full steady stroke of a conventional beam unit.

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This unit is also available with three drums; and with one or two pole telescoping mast equipped with racking board. Power is an Allis-Chalmers Model E563 slow speed tractor type four cylinder engine. It will burn natural gas, gasoline, Butane or low grade fuels.

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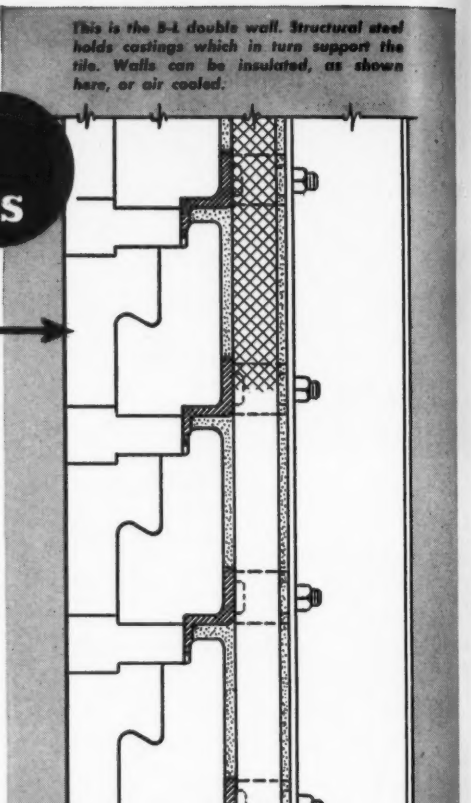
Cumulative loading is out; unit-suspension means that no brick bears more than its own weight. Previously, the resulting load of brick piled upon brick made the bottom of the wall (where temperatures are usually highest) the most vulnerable.

Applications? wherever heat must be controlled—for boiler settings in power plants; for oil stills and cat crackers in refineries; for all kinds of driers and kilns and metallurgical furnaces.

No cumulative loading



This is the B-L double wall. Structural steel holds castings which in turn support the tile. Walls can be insulated, as shown here, or air cooled.

In a nutshell, the rest of the story is as follows:

1. Walls and arches feature "built in" stability; any portion can be removed for replacement without weakening adjacent areas. Design provides for thermal expansion.

2. Refractories are easy to replace without disturbing undamaged sections. Maintenance is simple, quick, economical.

3. Construction is air tight; heat losses are reduced. Maximum efficiency can be maintained and fuel used to full advantage.

4. B-L engineers co-ordinate enclosure requirements with problems of temperatures, types of firing equipment, and slagging and erosion possibilities.

For more information, write Detroit direct, or contact one of the offices listed below.

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REFINING

Ohio Standard Will Build Oil Terminal in Cleveland

CONSTRUCTION of a new storage and transportation terminal in Cleveland, Ohio, has been undertaken by Standard Oil Co. (Ohio) as another important part of their $100,000,000 expansion program.

Connected with Ohio Standard's crude-oil pipe-line system, the terminal, composed of three 96,000-bbl. tanks, will store crude oil and pipe it to the Cleveland No. 1 plant. It will also be the main storage point for refined products produced by the refinery, and will connect with the company's products pipe line which supplies a large area of Ohio.

Completion of the $1,500,000 project will be accomplished next spring with the addition of a products pumping station and four tanks for refined products, three of which will be of 81,000-bbl. capacity and one of 96,000-bbl. capacity.

To connect the new terminal with Ohio Standard's crude-oil pipe-line system from Illinois and Oklahoma fields, Buckeye Pipe Line Co. is building a 100-mile, 12-in. line from Cygnet, Ohio, to the terminal.

Other Ohio Standard improvements and additions to storage in Ohio, increasing the expenditure for terminal facilities to $2,600,000 include three new tanks at Tiltonsville boosting capacity to more than 3,200,000 gal. and foam fire-fighting equipment; two new tanks at Canton, raising capacity to more than 3,200,000 gal., loading racks, and new pumps; three new tanks at Dayton, expanding capacity to more than 7,300,000 gal.; one new tank at Akron boosting capacity to more than 2,000,000 gal. and improved pumping facilities; relocation of Marietta terminal, shifting it across the river, adding tankage, office buildings, and warehouses.

Socony-Vacuum Plant Gets American Legion Award

Socony-Vacuum Oil Co., Inc.'s Augusta, Kans., refinery has received a certificate of appreciation from national headquarters of the American Legion, for an outstanding record in employing physically handicapped war veterans. Socony-Vacuum is one of 30 firms throughout the country which received such awards.

The presentation was made in connection with "National Employ a Physically Handicapped Week." Of 536 employes at the refinery, 190 are veterans of World War II, including 130 who returned after military service and 60 new ones. In addition, 38 World War I veterans are employed at the refinery for a total of 42.5 per cent.

Gas Odor Controlled by X-ray Photo Device

Engineers at Standard Oil Co. of California are now able to control the amount of unpleasant odor introduced into natural gas through the use of an X-ray device designed by General Electric Co. to measure the tetraethyl lead content of gasoline. Application of the device to natural gas will protect housewives and industrial workers.

Odor in natural gas comes from sulfur compounds known as mercaptans. A small quantity of correctly balanced mercaptan in a room is sufficient for quick identification, according to engineers. Mercaptans with too little sulfur, however, would be unnoticeable, while ones with excessive sulfur would be intolerable.

Ethyl Plans Seventh Plant To Make Tetraethyl Lead

Construction plans for a seventh tetraethyl lead plant at Baton Rouge, La., have been announced by Ethyl Corp. The new plant will duplicate in size and capacity the sixth plant already under construction, also located at Baton Rouge. The company has five tetraethyl lead plants in operation.

With completion of the two new units, production at Ethyl's Baton Rouge manufacturing plant, already the largest in the world, will be increased by 40 per cent.

Necessity for the expanded production, according to Ethyl officials, is explained by industry forecasts of continuing increases in the American production of gasoline over the next 5 years, plus an anticipated improvement in gasoline quality calling for an increase in the supply of antiknock compounds.

Ethyl's expansion program includes plans to increase the manufacturing facilities for the supply of such intermediate chemicals as metallic sodium and ethyl chloride, which are used in making tetraethyl lead, as well as adequate supplies of ethylene

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dibromide and ethylene dichloride which are used in the finished antiknock compound.

Ashland Sets On-Stream Record With 213-Day Run

A new on-stream record for a Dubbs cracking unit was recently claimed by the No. 1 plant of Ashland Oil & Refining Co.'s refinery near Catlettsburg, Ky. The unit operated a total of 213.58 days, or 5,126 hours without having been disassembled for cleaning or repair work.

The previous record of 178 days on-stream was reported in October by McMurrey Refining Co. at their Tyler, Tex., plant. Ashland's record is confirmed by Universal Oil Products Co., Chicago, which licenses such equipment and keeps records of its operation at all refineries.

At the time Ashland's Dubbs unit was shut down, there were no leaks and it was found that less coke had formed inside the pipes and towers than was expected. The shut down came as a result of plant safety practices rather than failure of the unit.

Bureau Publication Deals With Hot-Water Process

Started as a wartime measure to increase supplementary fuel sources, high recoveries of valuable hydrocarbons suitable for making gasoline, diesel fuels and fuel oils have been obtained from surface deposits of bituminous sandstones near Edna, Calif., according to a publication just released by the U. S. Bureau of Mines.

Describing a hot-water-separation process tested on a laboratory scale by Bureau engineers, the report shows recoveries of bitumen averaging 95 per cent from the Edna sandstones. Bitumen is a tarry substance from which some gasoline and fuel oils are extracted. These deposits are estimated to contain about 11 per cent bitumen or about 26 gal. a ton.

On the basis of an investigation made by the U. S. Geological Survey in the winter and spring of 1943-44, the Edna, Calif., sandstone deposits are estimated to contain about 232,880,000 tons of bituminous material, minable by open-cut methods, according to the bulletin's authors, G. B. Shea and R. V. Higgins, both Bureau petroleum engineers.

A free copy of the publication, Report on Investigations 4246, "Laboratory Study of the Hot-Water Process for Separating Hydrocarbons from Surface Deposits of Bituminous Sandstones Near Edna, Calif.," may be obtained by writing to the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.

Ashland Terminal Starts

Construction will start this month on a $500,000 products terminal at Jeffersonville, Ind., on the Ohio River for Ashland Oil & Refining Co. The terminal will serve both rail and river traffic and will have storage capacity of 7,000,000 gal.

New Esso Building Started

HOUSTON. — Construction is now underway at Baton Rouge on a new six-story main office building and a two-story cafeteria for the 180,000-bbl. Esso Standard Oil Co. refinery.

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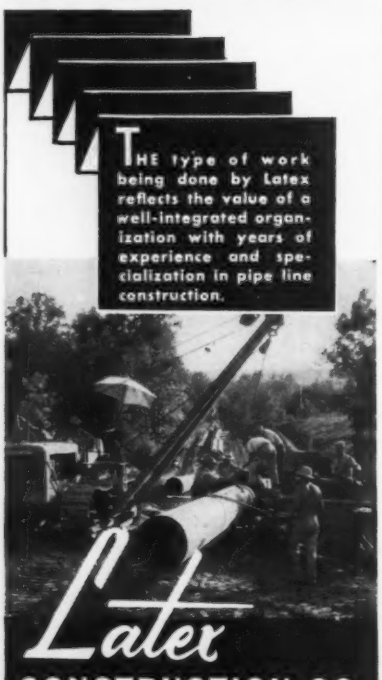
Pipe Line Equipment and Materials
Houston - Tulsa


THE type of work being done by Latex reflects the value of a well-integrated organization with years of experience and specialization in pipe line construction.
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HOUSTON, TEXAS ATLANTA, GA.
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PIPE LINES

I.C.C. Hints of Stricter Pipe-Line Controls

IN suggesting a program for the pipeline industry to follow Clyde B. Aitchison, member of the Interstate Commerce Commission, suggested that pipe-line owners "should not seek to avoid the functions of the office of common carriers. There must be regulation sufficient to see that they conform to every standard of fair dealing prescribed by Congress," he told the transportation division of the twenty-eighth annual meeting of the American Petroleum Institute in Chicago last week.

Despite the regulations that do apply to pipe lines, Aitchison declared, Congress has left the pipe lines on a basis of self-regulation, or industry regulation, on many details of their business operation.

"Now, granted that the industry has done a good job," the commissioner said, "and granted that during the war an excellent and patriotic service, and granted that need for more exacting provision of law has not been apparent, it does not follow that this condition of relative freedom for individual initiative can or should continue indefinitely.

"On the contrary, the probabilities for a stricter regulation are necessarily greater than they are for stricter regulation of the agencies now more tightly controlled."

One of the reasons such freedom from controls might end, he predicted, would be because the "relative immunity from fantastic price increases cannot continue indefinitely. Then, if detriment to the public interest and national economy result, further regulation to fit the case will follow."

There is an omnious portent "in that the United States is the last great country to adhere to the system of private ownership and operation of the means of transport," the commissioner declared.

Tennessee Gas to Complete 1,000-Mile Line Soon

Tennessee Gas Transmission Co. will complete within the next few weeks its 1,000-mile, 24 to 30-in. second line to parallel its original pipe line. The line will be completed at an earlier date than was expected and in time to meet winter fuel needs. In addition, it will give industries dependent on Tennessee Gas Transmission's customers for their fuel, hope that curtailments this winter will be eliminated or held to a minimum.

Survey Shows Gain In Public Utility Lines

PUBLIC-UTILITY companies owned 242,860 miles of natural-gas pipe line at the end of 1947, of which 88,470 miles were transmission lines, 27,200 miles were field and gathering systems, and 127,200 miles were distribution lines, it is reported in a statistical survey just completed by the American Gas Association.

This is the first time such data have been available, and the results of the survey have been made up into tables to supplement the current edition of the association's "Gas Facts" handbook which was recently distributed.

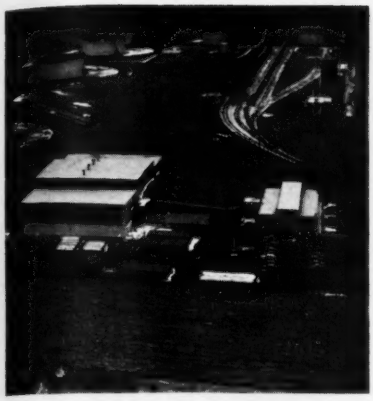
The survey, which includes only utilities, is broken down to show mileage of lines devoted to natural gas, manufactured gas, mixed gas, and liquefied petroleum gas, by states and regions, and for the years 1945, 1946, and 1947.

Postwar growth is shown by the fact that in 1945 utilities owned 77,270 miles of natural-gas transmission lines, 26,990 miles of field and gathering lines, and 113,910 miles of distribution lines. Total mileage for all types of service at the end of 1947 was 331,420, divided: 242,860 natural gas, 67,980 manufactured gas, 15,810 mixed gas, and 4,770 L.P.G.

Trunkline's Louisiana-Iowa Proposal Meets Difficulties

Proceedings on an application by Trunkline Gas Supply Co. for authorization to construct and operate a 26-in. 768-mile Louisiana-Iowa natural-gas transmission system, are to be continued by order of Federal Power Commission, for not more than 6 months, for the purpose of receiving more evidence from the company in support of their amended application.

Trunkline had asked for FPC hearings to be reconvened on November 15 but the request was denied by FPC which stated that "cross-examination or further hearing is not war-



In the Chicago Area...

Headquarters for Dependable Pipe Protection

Strategically located in Franklin Park, Illinois, a Chicago suburb in the switching district, are Pipe Line Service Corporation's general offices and another modern plant offering complete facilities for pipe cleaning, priming, coating and wrapping.

Here, a staff of engineers is constantly developing and conducting research to improve methods and equipment for all plants, thus assuring you of the most up-to-date cleaning, coating and wrapping application. Here, also, a modern, fully equipped machine shop produces all special equipment required for the operation of Pipe Line Service Corporation's six plants.

This plant has adequate space for handling and storing pipe. Switch track facilities are available for 30 cars of pipe at a time, and the plant is served by the Chicago, Milwaukee, St. Paul & Pacific R.R., as well as the Indiana Harbor Belt Line for handling shipments of protected pipe to any point in the country.

The Franklin Park plant is one of six serving pipe users on gathering, transmission and distribution lines.

Pioneers in Steel Pipe Protection

PIPE LINE SERVICE CORPORATION

General Offices and Plant: FRANKLIN PARK, ILL.

Plants at: Glenwillard, Pa.; Longview, Tex.; Corpus Christi, Tex.; Harvey, La.; Sparrows Point, Md.

ranted at this time because of the failure of Trunkline to present evidence which . . . establishes that it has a reasonably assured market for its natural gas, possesses the ability to finance the proposed project, or is able and willing properly to do the acts and to perform the service proposed."

FPC has withheld decisions on motions for dismissal of Trunkline's amended application filed by the National Coal Association, the Railway Labor Executives Association, and Gulfcoast Northern Gas Co.

Oklahoma Natural Extends Its Gathering System

The final phases of Oklahoma Natural Gas Co.'s three million dollar natural-gas pipe-line project are being completed, linking the company's main transmission line with the Golden Trend fields in McClain, Garvin, and Stephens counties in southern Oklahoma.

Gas from the Golden Trend area is produced in combination with oil, and Carter Oil Co., Sinclair Prairie Oil Co., Cities Service Oil Co., Warren Petroleum Co., and J. E. Crosbie, Inc., are jointly building three natural-gasoline plants located near Maysville, Antioch, and Lindsay to process their own wet gas and wet gas purchased from other operators in the field. All three of these plants will be operated by Warren. Skelly Oil Co. already has a natural-gasoline plant in operation in the area. Oklahoma Natural will purchase processed gas from all four of these plants.

Magnolia Completing Pump Station Facilities

Magnolia Pipe Line Co. is completing construction work at West Texas pump stations where units have been recently installed. All of these units were in operation by November 1. The program included the following installations: three 500-hp. electric centrifugal units at the Seminole, Tex., station to replace those destroyed by fire; two 400-hp. electric centrifugal units at the Andrews station; a 12-cylinder, 250-hp. gas engine driven centrifugal unit at the Seagraves booster station halfway between Mallet and Seminole; a 200-hp. diesel reciprocating unit was moved from the company's Addington, Okla., station for installation at the Mallet station. At Whiteface, north of Mallet, the company has installed a 200-hp. engine driven reciprocating pump unit. Installation of these units will increase Magnolia throughput in West Texas by 12,000 bbl. daily.

Magnolia Pipe Line Co. has prepared a sound film in color, entitled, "Underground River" which effective-

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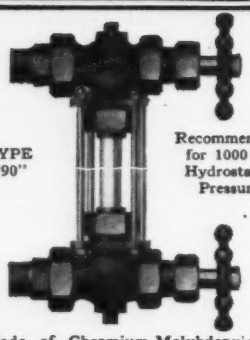

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Made of Chromium-Molybdenuin alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

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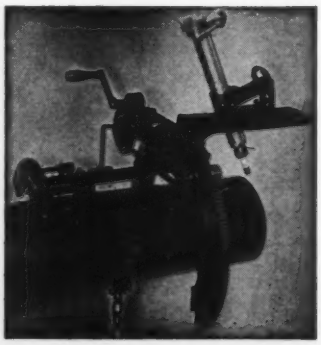

The H & M PIPE CUTTING and BEVELING MACHINE for 2 to 30-in. pipe

SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
ECONOMY: Save approximately one-half labor and gas costs.
PORTABILITY: Can easily be carried from one pipe section to another.

Write for literature

The H & M
Pipe Beveling Machine Co.
311 East Third Street, Tulsa, Oklahoma

ly shows general construction operations in the building of the Magnolia 650-mile, 20-in., Corsicana, Tex.,-Patoka, Ill., crude-oil line. Photography was largely done by Claude Wilson, electrical shop foreman, Magnolia Pipe Line Co.; continuity and editing was done by Hunt Guitar of Magnolia Petroleum Co. with the assistance of the staff of the pipe-line company. Organizations desiring to show the film at meetings should apply to John Terrell, director of Magnolia public relations, Magnolia Building, Dallas, Tex.

Posa Rica Gas Line to Be Completed in February

Completion of the 157-mile, 20-in. Posa Rica-Mexico City natural-gas line of Petroleos Mexicanos is scheduled for February 1, 1949. The last pipe deliveries from Cia. Manufacturera de Tubos de Acero, S.A., Monterrey, are expected to arrive late next month.

By October 25, the contractor, William Brothers Co., had laid 106 miles. At that time 6 miles of pipe had been strung ahead and 3 miles of right-of-way had been cleared.

Gas from Posa Rica field has 3 to 3½ per cent H_2S and 15 to 17 per cent CO_2. Definite information is not available regarding plans for dehydration and treating equipment and compressors. Actual deliveries of gas may depend on the time when special treating equipment would be installed.

Atlantic Adds New Dock at Atreco

Atlantic Pipe Line Co. has recently completed a dock at Atreco, Tex., in the Beaumont area which will add a third berth to existing facilities, thus making it possible to load three tankers simultaneously. The new dock is of steel H-beam and concrete construction similar to docking facilities built to serve Atlantic Refining Co. near Philadelphia.

Basin Pipe-Line System Construction Progresses

By the beginning of this week, 60 miles of 24-in. pipe had been laid for the Basin System in the 173-mile section now under construction between Wichita Falls, Tex., and Cushing, Okla. Construction of this 173-mile section is being handled by Smith Contracting Co. The entire Basin System from Jal., N. M., to Cushing, Okla., is being constructed by Texas Pipe Line Co. for the joint interests of Texas Pipe Line Co., Shell Pipe Line Corp., Empire Pipeline Co. and Sinclair Refining Co.

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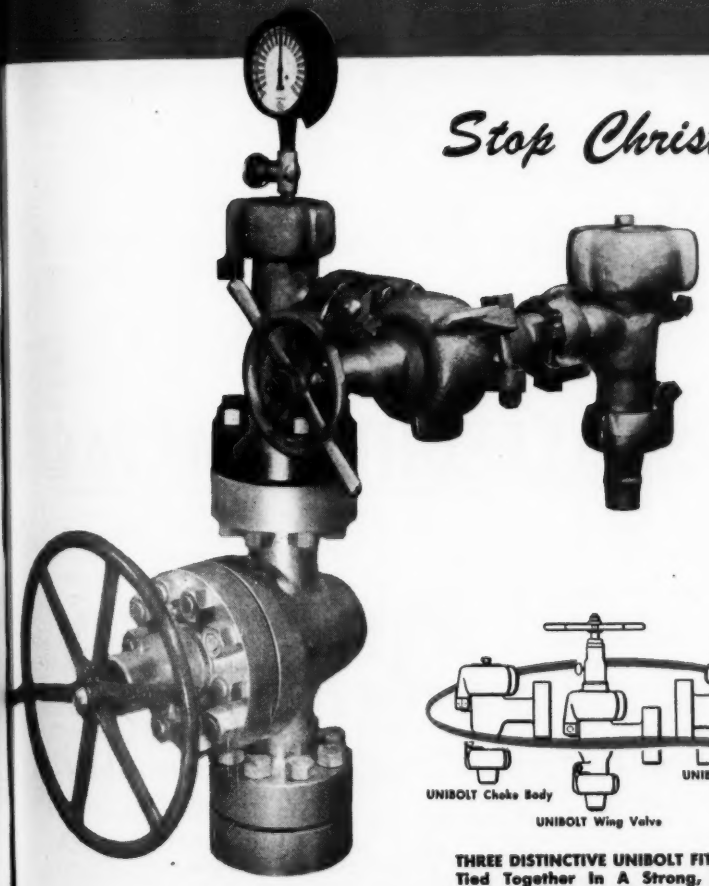
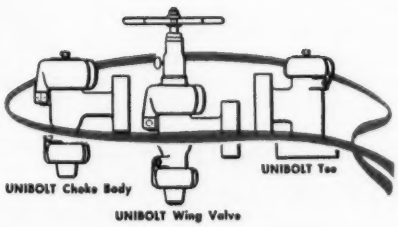


Stop Christmas Tree Corrosion!

Several years ago when the industry developed a market for gas-distillate production, UNIBOLT engineers initiated a research program to develop a corrosion-resistant alloy for Christmas tree flow wings. A number of stainless steels with varying heat treatments were investigated, but laboratory tests on one particular high-chrome alloy demonstrated unusually good corrosion-resistant qualities.

Test installations of UNIBOLT fittings from this alloy were begun nearly three years ago on wells where ordinary steel fittings had become extremely corroded in as little as 40 days. Recent inspections reveal that the corrosive gas-distillate flow from these wells has had absolutely no effect on the UNIBOLT high-chrome fittings.

Complete UNIBOLT Flow Wings (see illustration) are now offered in this same corrosion-resistant alloy in 5000 and 10,000 lbs. working pressure and in carbon steel in 3000 and 5000 lbs. working pressure. Because UNIBOLT Flow Wings are stronger, yet eliminate much of the bulk and weight of conventional Christmas tree wings, they are both safer and more economical.



THREE DISTINCTIVE UNIBOLT FITTINGS Tied Together In A Strong, Light-Weight, Pre-tested Flow Manifold.

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A lifetime servant that can stand up to your job—practically under *any* conditions of heat, corrosion and wear—that's what you get when you specify Allegheny Metal. Great strength and resistance to chemical or atmospheric corrosion . . . rugged ability to take a beating . . . bright, shining beauty and endless ease of cleaning . . . they're all yours with this time-tested stainless steel.

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NATURAL GAS

New York Asks for Query On Interstate Gas Rates

Federal authorities have been asked by the New York State Public Service Commission to investigate rates charged by interstate natural-gas companies.

The New York state agency said the rates in question affected the cities of Buffalo, Niagara Falls, Batavia, and Dunkirk. Three area utilities are seeking authority to increase rates on the basis of charges by interstate companies under FPC jurisdiction.

Iroquois Gas Corp. serving Buffalo and Republic Light, Heat & Power Co., serving Niagara Falls, Batavia and Dunkirk have asked the state commission to approve a consumer rate boost. Iroquois Gas Corp. gets more than 80 per cent of its natural-gas supply from United Natural Gas Co.

Suspended Rate Schedule Withdrawn by Interstate

A proposed supplemental rate schedule which would have increased rates and charges on natural gas sold to Mississippi River Fuel Corp., Texas Gas Transmission Corp., and Southern Natural Gas Co., has been withdrawn by Interstate Natural Gas Co. by permission of Federal Power Commission and proceedings with the Commission have been terminated.

FPC had previously suspended the schedules pending a hearing and decision that was to have been held November 8.

In its original order suspending the schedules, the Commission stated that the proposed increases in rates and charges would approximate a total of $130,700 during the first 12 months, an increase of more than 10 per cent.

Carbon Black Manufacturers Must Pay Occupation Tax

AUSTIN.—District court in Austin last week backed the contention of the state's attorney general that the manufacture of carbon black is subject to occupation tax.

In Travis County, Jack Roberts, district judge, has entered final judgment in favor of the state for $91,904 against Philtex Chemical Co. for taxes on carbon black. If Roberts' decision is affirmed on appeal, Attorney General Price Daniel expects to recover more than $500,000 from previous operators of the Philtex carbon black plant.

Future revenue to the state from the plant is estimated at $14,000 monthly.

Rizley to Discuss Gas Legislative Trends

Congressman Ross Rizley of Oklahoma, author of the Rizley Bill, introduced in the last session of Congress to define the powers of the Federal Power Commission, will discuss legislative trends affecting conservation of natural gas at the annual meeting of the Interstate Compact Commission in Wichita, Kans., December 10-11.

Rizley's discussion will fit perfectly into the general theme of the Wichita meeting, which will concern conservation of natural gas, it was pointed out by Gov. Beauford H. Jester, Compact chairman.

"Because of his active interest in state and federal legislation affecting the conservation of natural gas, Mr. Rizley is exceptionally well qualified to present the subject to the Compact Commission," Jester said.

August Gas Revenues Up 19 Per Cent Over Last Year

Operating revenues of natural-gas companies (based on monthly statements filed with the Federal Power Commission by 82 natural-gas companies) amounted to $54,869,936 in August 1948, an increase of 18.9 per cent over the same month last year.

Gas-utility operating income for August 1948 amounted to $5,209,896, up 12.3 per cent from the $4,641,170 reported for August a year ago. Net income for the month was $5,904,573 and represented a drop of 1.8 per cent from the net income for the same month last year.

Gas sales to ultimate consumers in August 1948 were 112,576,000,000 cu. ft., up 12.4 per cent over last year. Sales to residential consumers increased 5 per cent and to commercial and industrial consumers 10.4 and 12.6 per cent, respectively. Revenues from sales to ultimate consumers increased 11.1 per cent and amounted to $27,971,301. Revenues from residential and commercial consumers were up 5.7 per cent and 10 per cent respectively. Revenues from industrial consumers were up 14.5 per cent.

For the 12 months ended August 3, 1948, gas operating revenues totaled $803,946,798, an increase of 12.4 per cent over the comparable period a year before. Net income for the period amounted to $149,535,318, a gain of 2.1 per cent.

Delhi Order Is Reaffirmed

The Federal Power Commission, after considering an amended application filed by Delhi Oil Corp., for a status determination and declaratory order that the corporation will not be a "natural-gas company" subject to FPC jurisdiction, has reaffirmed its previous finding and stated that it is unable to issue the declaratory order as requested.

Natural Gasoline

Plans for Kirk Pool Plant Are Underway

HOUSTON. — Plans are underway for the construction of a $1,000,000 gasoline plant in Kirk pool of Eastland and Comanche counties with the organization of the Kirk Pool Operators' Committee.

Officers of the newly formed committee representing the field's 90 producers are: C. P. Porter, Dallas and Eastland, president; Bud Loomis, Longview, vice president; and I. C. Heck, Eastland, secretary - treasurer. Engineering committee for the group consists of Joe Cable, Wichita Falls; Frank Speller, Tyler; and W. R. Stearns, Austin.

Cost of the proposed plant is estimated at $1,000,000 with an additional $250,000 believed necessary to build the gathering system. A five-man committee consisting of the following has been set up to study the plant proposal: T. A. Kirk, Fort Worth; Robert McKissick, Abilene; J. W. Baldwin, Wichita Falls; F. O. Penn, Longview; and Jay Man, Wichita Falls.

November 16 has been set as the date for a hearing by the railroad commission to consider whether the Kirk pool should be shut in until gas flaring is stopped. Request for a reduction in the field allowable also will be heard.

Plymouth Increases Output

HOUSTON.—Production capacity of Plymouth Oil Co.'s gasoline plant at Sinton, in Patricio County, Texas, has been increased 25 per cent to 90,000 gal. daily. Plant is located in Plymouth field, 8 miles northeast of Sinton, and was put into operation last year.

Baash-Ross News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

OUR 28th YEAR

Another New Baash-Ross Product...

The Baash-Ross Hinged Casing Spider (below) closed and ready for use. Split Spider Bushings (right) lock in place to adapt Spider for smaller pipe sizes. Baash-Ross Type "UC" Casing Slips (top) are recommended for handling casing 7⅝" O.D. and larger. (For smaller pipe use Baash-Ross "DU" or "2MB" Rotary Slips.)

A Universal Casing Spider that meets every Casing Handling Requirement!

The BAASH-ROSS HINGED CASING SPIDER

THERE HAS long been a need for a lightweight heavy-duty casing spider universally adaptable to practically any pipe-handling requirement. And here it is—The Baash-Ross Hinged Casing Spider. Though light in weight, it will safely support the longest and heaviest casing strings. And note its wide-range adaptability . . .

- You can place it directly on top of any type or size rotary table for supporting casing strings too large to be run through standard rotary master bushings. No need to remove the rotary table, no wasted time disconnecting the table drive and then reinstalling and realigning the table hook-up.
- Or, if preferred, you can use the Hinged Casing Spider on a platform that replaces the rotary machine.
- Or on workover, salvage and other operations where no table is installed, the Hinged Spider can be supported directly on cribbing, thus providing a quick and convenient method of handling casing and other pipe.

HINGED FOR QUICK EASY INSTALLATION

By simply pulling a pin, the Baash-Ross Hinged Casing Spider can be quickly opened, thus permitting its installation without need for stripping the unit over any pipe that may be hanging in the well. The double pin arrangement not only permits the Spider to be opened on either side, but also permits the Spider to be separated into two parts for maximum ease in handling and transporting. Hinge pins as well as handles are streamlined into the body contour, while a generous slip-supporting platform and safety grid, low overall height and wide solid base all contribute to maximum safety and crew convenience.

MAXIMUM CASING ADAPTABILITY

Wide-range installation adaptability is only *one* of the features in the Baash-Ross Hinged Casing Spider, for it is equally adaptable to handling a complete range of pipe sizes 18⅝" O.D. and smaller.

The Spider is made in *four* basic sizes . . . 18⅝", 16", 13⅜" and 10¾" . . . and each basic size will not only handle the diameter of casing corresponding to its size designation, but can be readily adapted to handle any smaller size of casing by simply inserting removable Spider Bushings.

These Spider Bushings are split and are retained solidly in place whether the Spider is open or closed. And regardless of the basic size, each Casing Spider can be bushed down, if desired, to the bore and taper of a standard rotary master bushing, thus permitting the use of standard rotary slips for handling small casing as well as any other pipe sizes that can be supported in regular rotary slips.

Get full details on this new Baash-Ross Hinged Casing Spider from your nearest Baash-Ross representative—or write direct for additional data.

Among the

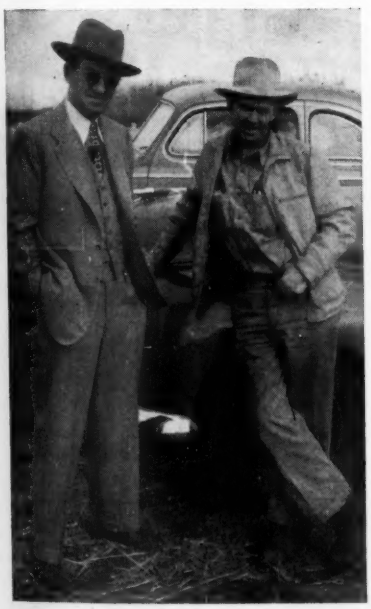
Drilling Contractors

Imperial Rigs Increase 900 Per Cent in Alberta

Imperial Oil, Ltd., has recorded a 900 per cent increase in drilling rigs engaged in Alberta since its discovery of Leduc field in February 1947. At that time the company had a total of 4 rigs in operation in Alberta out of a total of 20 rigs for all companies in the province.

Imperial now has 38 drilling rigs in operation or moving to location, 9 of which are company owned and 29 are contract rigs. In addition, Imperial is at present refitting four rotary rigs recently brought from Norman Wells where they were used during Canada's wartime oil program.

S. B. Roberts Co., Abilene, Tex., has contract to drill the Paul Moss 1 Lee and Waymon Smith, 6,300-ft. wildcat, located 2,310 ft. from south and west lines of Section 127, Block D, H&TC Survey, 3½ miles south of Aspermont, Tex., in central Stonewall County.



Paul Guthrie (right) is superintendent in the Leduc area for Northern Development Co., one of the larger Canadian drilling contracting companies. With him at a wildcat location his company is drilling for East Leduc Oils, Ltd., in the Saunders Lake area, 10 miles southeast of Leduc, is Fred S. Dewel (left), manufacturers' representative, Casper, Wyo.

Peel Drilling Co. has contract for Nadel & Gussman 1 Lambert, NE NE SE 30-9-20, 1 mile southeast of 1 Baldwin, NW NW NW 30-9-20, on the Rooks-Graham county line in Kansas.

Coastal Drilling Co. has contract to drill British American Oil Producing Co. Beer B 85-21 in the Blackwells Corner area of Kern County, California.

J. C. Hawkins will drill Magnolia Petroleum Co. 1 W. J. Burnett, Hurricane Creek field, Beauregard Parish, Louisiana, to a contract depth of 9,000 ft.

B. & R. Drilling Co., Inc., has begun operations at the 1 Teall "B" lease, NE NE SE, 25-9-21, 1 mile southeast of the Morel pool in Graham County, Kansas.

Camay Drilling Co. has contract to drill Union Oil Co. of California Omega 1 in Bardsdale field of Ventura County, California.

R. C. Patton Co. has contract to drill the Lindas Oil Co., Inc., and M. B. Armer 1 Pfaff, NW SE NE, 15-34-10, in the Hazleton townsite in southeastern Barber County, Kansas, 6 miles north of the Oklahoma line. Location is 17 miles southeast of the Boggs pool. The test will be approximately 5,000 ft.

Iron Drilling Co. is making hole at 1 Ashcraft, NE NE SE 32-4-18, east of the Logan pool in southern Phillips County, Kansas.

Noble Drilling Corp., which recently brought in two National 75 rotary rigs to Alberta, will drill the Imperial Pigeon Lake wildcat in LSD 4 36-47-3w5th, about 25 miles southwest of Leduc field. The other Noble rig is working for Imperial Oil, Ltd., in northwest Alberta at Clairmont No. 1, LSD 16 25-72 5w6th.

Brunson Drilling Co. has begun operations at the Robert L. Williams 1 Pritchard, NE NE NE 22-22-14, 2 miles northeast of the Nellie pool in Stafford County, Kansas.

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WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

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Length	7' 6"	5'
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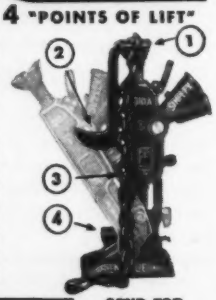

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History.—Commonwealth Drill-Co., Ltd., one of the Commonwealth Petroleum, Ltd., group of companies operating in Canada with headquarters at Calgary, Alta., was organized in 1939 during the boom drilling days of Turner Valley field. Its first rig, a heavy-duty steam-powered assembly, was one which the parent company had used in developing its own properties in that field. As these properties became drilled up, the drilling company began to contract for other companies in that field, and since has gradually expanded.

Equipment.—Currently, the company operates 12 rotary drilling rigs and 3 well-servicing units. All the drilling rigs now are mechanically powered, and range in drilling depth capacities from 2,000 to 10,000 ft.

Present operations.—With the exception of one light rig running in the Saskatchewan Province side of the Lloydminster shallow producing area, all rigs are now on Alberta Province locations. Five are working in Leduc field, one in the Drumhueller gas area, one in Princess field, and the remainder on scattered wildcat locations.

Personnel.—The company is headed by F. F. Reeve as president. A native of New York, Reeve for several years operated a tug-boat business at New York City. Disposing of this business in 1917, he acquired a ranch in Alberta Province, on which he lived for 8 years before moving to Calgary in 1925 to enter the real-estate business. Acquiring property in Turner Valley field, he turned his attention to oil and organized Commonwealth Petroleum, Ltd., which, with several associated oil companies, he has continued to head. With him in the drilling company are George Wright, vice president, and Gordon McKay, secretary-treasurer. Lloyd McCallum is his field superintendent.

Sidelights.—The company owns servicing yards at Calgary, Edmonton, and Lloydminster and is prepared to do most all its own rig overhauling, maintenance, and repair work.

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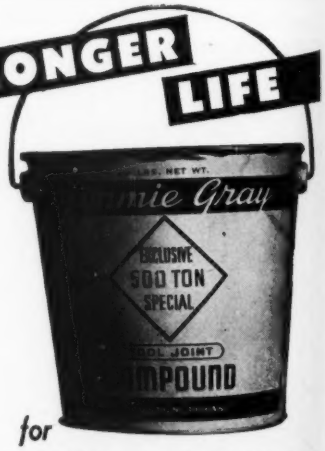

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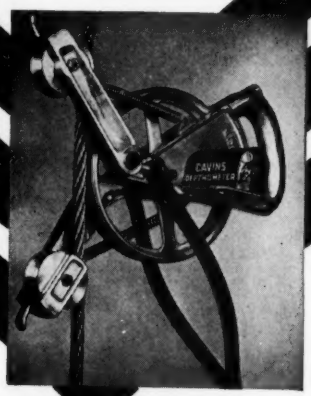

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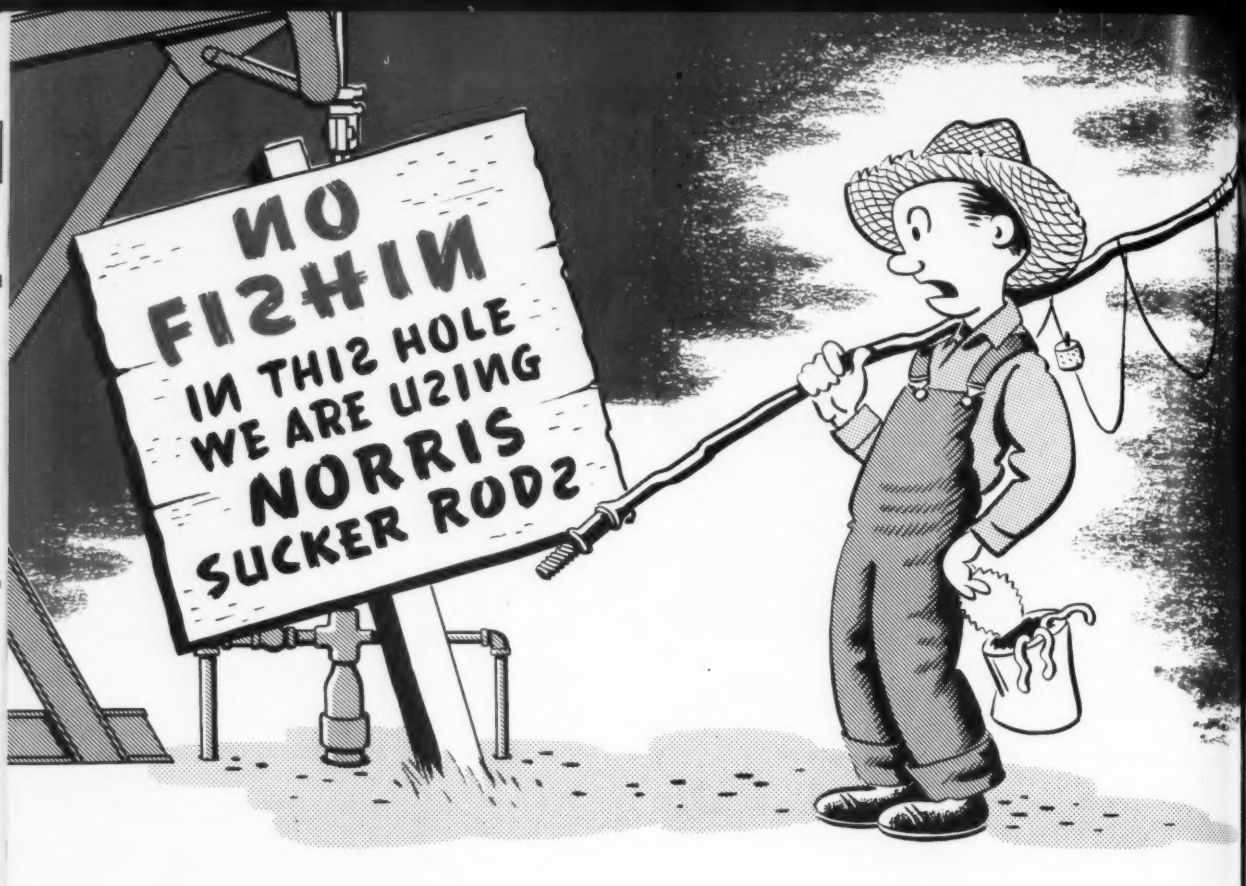

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Exploration and Drilling

East Side of Permian Basin Draws Attention

THE Permian basin area of Texas continues to be a red-hot exploration area. Despite the fact that production is now approaching the 800,000-bbl.-per-day mark, the scope of the exploration play, and the successes that mark that play, tend to cause geologists to think of it in terms of an area that has just been well scratched explorationwise.

With the pre-Permian exploration and development play along the west side just coming into its own, and expanding over into New Mexico on a more extensive scale, the Benedum strike caused a great expansion of interest in the south end, which continues.

However, the east side, which, beginning with Sun Oil Co.'s three strikes in Coke County, has had a series of important discoveries, refuses to allow developments in other parts of the basin to shove it out of the limelight.

Northwest Scurry County is contributing two Canyon lime (Pennsylvanian) strikes, one about 7 miles southwest of the town of Snyder, Sun 1 Emil Schattel, flowed 480 bbl. of oil per day from the Canyon pay at 6,868-91 ft. The second, Standard Oil Co. of Texas 1 Jessie Brown, 1,880 ft. from north and 1,980 ft. from the west lines of Section 440, Block 97, H&TC Survey (9 miles northwest of Snyder), on drill-stem test flowed 30 bbl. of 42.5°-gravity oil in 1 hour from the Canyon pay at 6,261-72 ft. Both of these discoveries are indicated to be reef limestone developments. The Canyon, while Pennsylvanian, lies above the Strawn, which is the reef producing zone in Jameson field in Coke County, the field that first kicked off the big play on the east side. The Sharon Ridge production in southwest Scurry County is from the Permian.

Meantime a new field, or at least a new reservoir, is apparently developing in the Jameson area of Coke County. Al G. Hill 2 Harris, Section 532, V. Homann Survey, 1 mile southeast of the nearest Strawn crinoidal-reef lime producer in the field, flowed 15 bbl. per hour for 7 hours from a sand pay in the Strawn. Hill 1 Harris, ¼ mile west, was perhaps the real discovery of the Strawn sand production, but having been salvaged as a 30-bbl. pumper, after plugging back from an Ellenburger failure, it did not attract too much attention. Several of Sun's wells in Jameson field, enroute to the reef lime pay, had shows of sand oil up the hole, but none made commercial production.

Elevations on the two Harris wells are No. 1, 1,970 ft., and No. 2, 2,001 ft. The first well topped the Strawn at —3,500 ft., and had the top of the sand phase at —3,838 ft. The second well, which flowed, had top of the Strawn at —3,467 ft., and top of the sand phase at —3,807 ft. Thus No. 2 checked 33 ft. high on top of the Strawn, and 31 ft. high on the sandy phase. No. 2 Harris actually cored sand from —3,807 to 47 ft., and cored shale from —3,847 to 61 ft., the latter being total depth.

The drill-stem test was made in the interval of 5,815 ft. (bottom of casing), and 5,848 ft., or datum interval of —3,814-47 ft. The 15-bbl.-per-hour flow was through a 12/64-in. tubing choke. Flowing pressures during the 7-hour test averaged 350 psi. on tubing and 800 psi. on casing. Preceding this test, the well averaged about 20 bbl. per hour through a ¼-in. choke, with gas-oil ratio of 1,800 cu. ft.

On potential test, it flowed 358 bbl. of 48.4°-gravity oil in 24 hours, through a 12/64-in. choke, gas-oil ratio of 1,272 cu. ft. per barrel, flowing pressures of 340 psi. on tubing and 805 psi. on casing. Official completion data reports pay at 5,808-48 ft., or datum of —3,807 to —3,847 ft.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—Shows of oil in the Wall Creek were found in Esperado Mining Co.'s wildcat northwest of the Lodgepole area, Weston County, Wyoming, and the operator is now drilling ahead for a test of the Dakota. The California Co. tested water on their Upper Valley wildcat, Garfield County, Utah, and will probably plug back for further tests of the saturated Pennsylvanian zone. American Liberty Oil Co.'s Paradox Valley, Colorado, wildcat is now below 7,800 ft. and may be out of the Paradox salt section. Gas was tested in the Morrison at the Kerr-McGee Oil Industries and Phillips Petroleum Co. wildcat on Garmesa, Garfield County, Colorado.

WEST TEXAS.—First Ellenburger production, and the fourth pay, was assured for the Shafter Lake field, Andrews County, at Sinclair Prairie 2-154 University, Section 24, Block 13, University Lands. From top of the Ellenburger at 11,695 ft.—11,746 ft., total depth, a 3-hour test recovered 6,636 ft. of clean 41°-gravity oil. Other pays in the area are Clearfork, Wolfcamp, Pennsylvanian and Devonian. Humble 22 Parker completed for a flowing potential of 250 bbl. of 43°-gravity oil from the Devonian at 8,245-8,330 ft., to become the second well and ½-mile east offset to the West Parker field, southwestern Andrews County.

EAST TEXAS.—Drilling activity around the southeast flank of the Carthage oil and gas field, Panolia County, was given further impetus at M. B. Chastain 1 Biggs, southeast of Deadwood and about 6 miles southeast of the field boundary, when it flowed gas and a spray of distillate on a test of the upper Pettit

NORTH TEXAS.—Cities Service 1-B Berry, Chico field, Wise County, is the field's first completion from the 5,400-ft. zone of the conglomerate. It gaged 459 bbl. daily with gas-oil ratio at 678 cu. ft.

TEXAS GULF COAST

Jasper County Opens A New Oil Field

HOUSTON.—A new oil field 3½ miles west of Bessmay townsite in the southern portion of Jasper County has been opened by Placid Oil Co. and H. L. Hunt 1 J. S. Richardson Heirs, in William Weiss Survey, Abstract 689. On a 24-hour initial test, the well flowed at the rate of 154 bbl. of 45°-gravity oil per day with flowing pressure on the tubing at 2,200 psi., casing pressure 2,500 psi. Total depth is 8,350 ft., with 7-in. casing cemented at 7,505 ft. Production is through perforations at 7,457-69 ft.

Western Natural Gas Co. 1 Ed Zengerlie et al, new gas-condensate field discovery in southeastern DeWitt County, has been gaged at an estimated 3,000,000 cu. ft. of gas plus 90 to 100 bbl. of condensate per day through a ¼-in. choke, with 2,300 psi. tubing pressure and 2,500 psi. casing pressure. Total depth is 8,702 ft., with 5½-in. casing set to 8,208 ft. Production is through perforations at 8,158-68 ft. This discovery is located 3 miles southeast of Arneckville, in James Quinn Survey, Abstract 395.

Fidelity Oil & Royalty Co. 1 W. H. Reeves, wildcat test southwest of Coletto Creek field and north of Cologne field, in Victoria County, has been completed for a gas well in the Frio zone through perforations at 4,010-20 ft. Potential gage has been run but figures were withheld by operators. Total depth is 5,020 ft. This test is located in J. M. Cobarrubias grant.

Midfields field in Matagorda County has been extended to the southwest by Sun Oil Co. 1 St. Louis Brownsville Corp., located in I&GN Survey 2, Abstract 238. Drilled to a total depth of 9,175 ft., with 5½-in. casing cemented on bottom, this well flowed 37 bbl. of oil per day through an 8/64-in. choke, flowing pressure on tubing 910 psi. Gravity of oil 45°. Production is through perforations at 9,126-30 ft.

Grubb and Hawkins 1 Clark, wildcat test which blew out from a high-pressure gas sand at 4,950-ft. level in Lavaca County, has been brought under control. The operators are preparing to put the hole into shape to resume drilling on a test scheduled to go to approximately 11,000 ft. in the Wilcox zone. It was estimated the well blew around 100,000,000 cu. ft. of gas per day. This well is located in J. H. Clavton Survey, 12 miles southeast of Hallettsville and 4 miles west-southwest of the Provident City field.

There were 30 new locations for Districts 2 and 3 reported this week, which included 8 wildcat starts, 3 in Brazoria and 1 each in Calhoun, Goliad, Harris, Karnes and Wharton counties. Two successful exploratory tests were reported, one a new gas sand for Beech Creek pool in Hardin County, and one oil sand for North Durkee field in Harris County. Eleven wildcat failures were reported, two in Jefferson, and one each in Austin, Chambers, Fort Bend, Goliad, Harris, Jackson, Live Oak, Refugio and Victoria counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Hardin County: New gas sand, Beech Creek —American Republics & Houston of Texas 3 H & T C-Fee, in H&TC Sur., Tr. 2, TD 7,555 ft., top sand 6,458 ft., perf. 6,458-65 ft., IP: 3,234,000 cu. ft. gas per day through a ¼-in. choke, TP 2,224 psi., shut-in pressure 2,405 psi., gravity 35.7°. (An old well worked over—originally completed as an oiler through perforations at 6,272-75 ft.)

Harris County: New oil sand, North Durkee —Union Producing Co. 1 Langtry et al, in W.C.R.R. Sur., A-937, Sec. 21, Blk. 4, total depth 7,610 ft., top sand 7,084 ft., perf. 7,085-90 ft., IP: 140 bbl. oil per day through 9/64-in. choke, GOR 781, TP 760 psi., CP 2,000 psi., gravity 35.6°.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Austin County: Magnolia Petroleum Co. 1 Charlie Zapalac, in BBB&C Sur., Abst. 137, 2 mi. south of McDowell townsite, dry, TD 9,975 ft.

Chambers County: Gulf Oil Corp. 4 W. F. Mayes Est. et al, in Chas. Dorsett Sur., A-492, 1¾ mi. NW of Lost Lake field prodn., dry, TD 10,383 ft.

Fort Bend County: Cutbirth - Williams-Thompson 1 Wessendorff Bros., in Samuel Isaacs Sur., A-35, 5½ mi. NW of Richmond townsite, dry, TD 7,650 ft.

Goliad County: Magnolia Pet. Co. 3 Wilkinson Est., in Wm. P. Miller Sur., 2 mi. N-NE of Berclair townsite, dry, TD 3,700 ft.

Harris County: Edwin B. Cox & Jake L. Hamon 1 Lydia Marquart et al, in D. Middleton Sur., 2 mi. SW of Addicks townsite, dry, TD 8,515 ft.

Jackson County: Jack W. Frazier 1 W. M. Classen et al, in James Kerr league, 8 mi. NW of Edna, dry, TD 4,775 ft.

Jefferson County: General Crude Oil Co. et al 1 T. F. Rothwell et al, T&NO Sec. 67, 7 mi. NW of Winnie, dry, TD 8,900 ft.

Warren Oil Corp. 1 Texas, Manuel Chirino Sur., 2 mi. SE of Fannett, dry, TD 8,720 ft.

Live Oak County: Pan American Producing Co. 1 S. R. Knight, in J. R. Johnson Sur., A-263, 7 mi. E of Oakville, dry, TD 4,112 ft.

Refugio County: Barnsdall Oil Co. 1 Hal Parks, in Sec. 9, Johnson & Pugh. subd. of Bonnie View Ranch, 10 mi. SE of Woodsboro, dry, TD 8,476 ft.

Victoria County: W. L. Goldston et al 1 Bankers Mortgage Co. et al, Blk. 5, Lake Placedo townsite, Alejandro Esparza gr., dry, TD 6,625 ft.

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SOUTHWEST TEXAS

Atlantic Discovery Opens McMullen Area

CORPUS CHRISTI.—Atlantic Refining Co. & Newman Bros. et al 1 Gubbels, new discovery in northern McMullen County, flowed oil at the rate of 93 bbl. per day on a 12-hour test made through a 5/32-in. choke, with 250 psi. tubing pressure, and casing sealed. The oil is 33.9°-gravity, with gas-oil ratio of 325. Production is from the basal Wilcox zone from open hole at 5,422-25 ft. Total depth is 5,425 ft. with casing set at 5,422 ft. on top of the pay sand. This well is in the northerly northwest corner of G. H. Smith Survey 26, Abstract 430.

A new oil discovery in the Lytton Springs area of Caldwell, Wiegand Bros. 1 Pat King is reported to be completed for an estimated 100 bbl. of oil per day on pump from open hole at 1,453-1,585 ft. Total depth is 1,585 ft., with 5½-in. casing set at 1,453 ft. on Austin chalk, topped at 1,476 ft., and showing saturation at 1,476-90 ft. This discovery is in Sampson Connell Survey, Abstract 63. The operators are drilling 2 Pat King 600 ft. northeast of the discovery.

Humble Oil & Refining Co. 1 Doering, wildcat 5 miles southwest of Pearsall field, in Frio County, recovered 570 ft. of 26°-gravity oil from the Austin chalk at 5,512-42 ft., plus 60 ft. of oil-cut mud. Drill-stem tests in the Taylor series at 4,072 ft., 4,090 ft., and 4,100 ft., showed good for gas-condensate production. Operators are now coring ahead below 5,682 ft. This well is located in Block 4, D. D. Harrigan's Leonoa Valley Farms subdivision, in O. Crawford Survey 10.

A new oil pay zone at the Borosa field, Starr County has been opened by Sunray Oil Corp. B-1 Slick Estate, and flowed at the rate of 145 bbl. of oil per day through a 5/32-in. choke, with 600 psi. tubing pressure and 860 psi. casing pressure. Production is through perforations at 4,465-75 ft. This well is 1,050 ft. northwest of the company's 1 Davenport-State oil discovery well, in Survey 267.

A new deep sand at St. Charles gas-condensate field in Aransas County has been opened at Western Natural Gas Co. 9 St. Charles Ranch. Completion was made through perforations at 10,804-10,915 ft. Although an estimate of the open-flow potential was not available, it was reported to be up in the hundreds of millions of cubic feet. Preliminary test was reported at the rate of 4,250,000 cu. ft. gas per day with heavy spray of condensate through a 3/16-in. choke, with 5,700 psi. working pressure, shut-in pressure 7,400 psi. Total depth is 12,020 ft., with 7-in. casing at 11,075 ft., and 5-in. liner run to 11,862 ft. On previous test through perforations at 11,430-80 ft., it flowed at the rate of 12,000,000 cu. ft. of gas and 106 bbl. of condensate per day through ¼-in. chokes on a drill-stem test, with bottom-hole pressure of 3,280 psi. open and 5,440 psi. shut in, and the recovery was 1,400 ft. of condensate. This well is in R. D. Blossman Survey 199 on St. Charles Peninsula.

There were 51 new locations reported for Districts 1 and 4, of which 22 are wildcat starts, 3 each in Starr and Webb, 2 each in Bastrop, Caldwell, Edwards, Jim Hogg, Nueces, San Patricio counties, and 1 each in Hays, Jim Wells, Williamson and Zapata counties. Three wildcat failures were reported, one each in Atascosa, Edwards, and Guadalupe counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Atascosa County: Sullivan and Garnett 1 Lee Cowley, in V. Tarin Sur. 1306½, 2 miles W-SW of Anchorage, dry, TD 2,734 ft.

Edwards County: V. J. Meyer 1 L. D. Wardlaw, in GC&SF Sur. 6, Blk. F, 20 miles W of Rock Springs, dry, TD 380 ft.

Guadalupe County: Riddle Oil Co. 1 Kirby Mudd, in A. M. Esnaurizar XI lge. gr., dry, TD 1,096 ft.

EASTERN TEXAS

Carthage Area May Get 6-Mile Extension

DALLAS.—M. B. Chastain 1 Biggs, Needham Survey, 5 miles southeast of the town of Deadwood, promised to become a 6-mile southeast extension to the Carthage oil and gas area of Panola County. The wildcat ran a 30-minute drill-stem test at 6,031-6,115 ft. in the lower Pettit, which flowed an unestimated amount of gas, on bottom-hole pressure of 2,200 psi. Operators were drilling ahead below 6,220 ft. and were to penetrate 150 ft into the Travis Peak before running electrical surveys. The well reported oil shows in the Goodland limestone at 2,535-90 ft. while drilling. A drill-stem test in the upper Pettit at 5,015-45 ft. gaged 8 to 10 millllion feet of gas, with a spray of distillate, and recovered 280 ft. of oil-cut mud. The last drill-stem test, to 6,115 ft., also made some straw-colored distillate. Location of the well is on a 6,000-acre block, and successful completion would inaugurate an extensive drilling campaign, it was said.

In Nacogdoches County, Arkansas Fuel Oil Co. 1 Sarah B. Adams, 1¼ miles east of Garrison, plugged back to 7,127 ft. from 7,865 ft., total depth. The well was swabbed in after an acid treatment of perforations in the Rodessa at 7,109-19 ft. It cleaned into pits, then gaged 1,000,000 cu. ft. of gas a day through 18/64-in. choke, on a flowing tubing pressure of 450 psi.

Standard Oil Co. of Texas 1 Acker, Cherokee County wildcat northwest of Maydelle,

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perforated at 8,670-78 ft., then ran a drill-stem test with packer at 8,652 ft. Using 1,020 ft. of water cushion and ¼-in. chokes, it brought gas to the surface in 23 minutes, the water cushion in 33 minutes, and reached a maximum surface flowing pressure of 800 psi. Recovery was 630 ft. of salt water and 30 ft. of mud, in addition to the cushion. Operators squeezed and will reperforate to retest at the same interval.

G. L. Walker 4 Pure Oil Co.-P. I. Bowling, W. H. Walters Survey, was flowing oil by heads, estimated at 30-35 bbl. a day. Gas volume was 50,000 cu. ft. daily.

Humble Oil & Refining Co. 1 Milner, northwest of Fosterville in Anderson County, was attempting to plug back to 10,200 ft., where a drill-stem test is planned in the James lime.

In Smith County, Humble 1 Wintters was drilling and coring below 9,576 ft. L. M. Lockhart 1 J. A. Reet, John Newton Survey, 2 miles north of Lexington in Lee County, was drilling hard lime and shale at 9,327 ft.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Bosque County: American Liberty Oil Co. 1 H. J. Reichert, Joseph Harlan Sur., 7 mi. N Valley Mills, dry, TD 8,000 ft.

Denton County: The Texas Co. 1 F. B. Huey, R. M. Burleson Sur., 2½ mi. S Sanger, dry, TD 2,324 ft., tested salt water, some oil and gas at 1,977-84 ft.

Falls County: F. H. Carpenter 1 S. B. Landrum, George Allen lge., W of Brazos River, 7 mi. W Marlin, dry, TD 1,302 ft. in Edwards lime.

Henderson County: J. P. Owen, E. R. Lamb and Newton Oil Co. 1 Mrs. Willie DeArman, J. S. Cordova Sur., 3 mi. NW Cross Roads, dry, TD 8,367 ft., Austin 3,280-3,677 ft., Woodbine 4,030 ft., Glen Rose 6,235 ft., Bacon 7,482 ft., upper Pettit 8,092 ft., lower Pettit 8,167 ft., Travis Peak 8,255 ft., elevtions 331 ft.

Leon County: Delta Drilling Co. 1 H. T. Moore, Fernando Del Valle lge., 2 mi. NE Middleton, dry, TD 7,950 ft., Pecan 6,065 ft., Austin 7,005 ft., sub-Clarksville 7,360 ft., Woodbine 7,620 ft., by samples.

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SOUTH LOUISIANA

Pool Opener Located In Calcasieu Parish

NEW ORLEANS.—Sun Oil Co. 1 Swift, a wildcat discovery in the Melville area of St. Landry Parish, is shut in with a pressure of 3,350 psi., and tanks are being erected for the potential flow test. Completion is through perforations at 11,240-45 ft. On a drill-stem test, using ¼-in. bottom and ⅛-in. top chokes, with a 2,500-ft. water blanket, developed 3,100 psi. working pressure. When tool was closed, recovered 10 thribbles and a double of fluid, 5 stands of condensate. This discovery is located in Section 23-4s-7e, approximately 2½ miles southwest of Melville townsite, and nearest production is Krotz Spring field approximately 10 miles to the south. Total depth is 12,500 ft., with 7-in. casing cemented on bottom.

Potential gage has been made on new oil pool opener in Calcasieu Parish. Union Oil Co. of California 1 Powell, located 7,500 ft. northeast of East Moss Lake production, in 5-11s-9w, flowed a potential of 97 bbl. of 34.8°-gravity oil per day through a 6/64-in. choke. Flowing pressure on tubing 1,075 psi., showing 0.1 per cent water on the flow. Total depth is 9,303 ft., with perforations at 8,569-74 ft.

Oil production in the Pointe A La Hache gas-condensate field in Plaquemines Parish was indicated when S. W. Richardson E-7 Humble-Delacroix Corp. flowed 168 bbl. of fluid per day, 30 per cent of 36°-gravity oil and 70 per cent salt water through a ⅛-in. choke on test through perforations at 9,480-82 ft. Total depth is 11,040 ft., with 7-in. casing cemented at 11,024 ft. Sands at 10,883-92 ft. were tested and flowed 48 bbl. of condensate per day through a 10/64-in. choke. This test is located in Section 34-16s-14e.

Sohio Petroleum Co. B-1 Harry B. Nelson, wildcat test in Section 14-9s-1e, Iberville Parish, approximately 8 miles west-northwest of St. Gabriel production, is being tested. On a 4½-hour drill-stem test through perforations at 10,305-15 ft., using ¼-in. bottom and ⅛-in. top chokes, developed a slight blow in 16 minutes and recovered 38 stands of water cushion, 9 stands of oil-cut mud, 33 stands of 29°-gravity oil, and 21 stands of salt water. Perforations were then acidized and production packer hung at 10,295 ft. Using a 10/64-in. choke, test is reported to have flowed at the rate of 2½ bbl. of fluid per hour, 50 per cent oil and 50 per cent water with tubing pressure at 315 psi. Operators are preparing to squeeze off this section and reperforate another zone for further tests.

Salt was found near 3,000 ft. at Humble Oil & Refining Co. 1 Pelican Island State lease, Account 1, Block 30, a wildcat in the Pelican Island area of Plaquemines Parish, located 8 miles offshore in the Gulf of Mexico, 12 miles south of Bastian Bay production. Oil shows were encountered from 2,152-85 ft. A string of 9⅝-in. protection casing was cemented at 2,572 ft. Operators are continuing to drill in salt at 3,019 ft.

Sixteen new locations reported this week for Louisiana Gulf Coast, three being wildcat starts, one each in Acadia, Beauregard and Vermilion parishes. Two wildcat failures were reported, one each in Avoyelles and Beauregard parishes.

SOUTH LOUISIANA WILDCAT FAILURES

Avoyelles Parish: Hunt Oil Co. 1 Wade Bordelon, 56-2n-4e, in North Marksville area, dry, TD 7,959 ft.

Beauregard Parish: Pan American Production Co. 1 Rice Land & Lbr. Co., 24-4s-11w, 4 mi. south of Neale field, dry, TD 7,804 ft.

N. CENTRAL TEXAS

Two Discoveries Reported In Montague County

WICHITA FALLS.—Montague County reported two discoveries ready for completion gage, and a third well in prospect. Russell Maguire 1 Stewart, Block 19, J. Y. Castillo Survey, 5½ miles west of Nocona, flowed 320 bbl. of oil in 5 hours through ¼-in. choke, and was shut in for additional storage. The flow was from casing perforations at 5,365-71 ft. in the Bend conglomerate. An east offset to the discovery, being drilled by the same company as the 1 Lady Wilson, was below 2,500 ft. Location of the new strike is about 1 mile northwest of Rogers & Rogers field, but is separated from it by dry holes.

Russell Maguire 1 Stansall, 8,000 ft. south and slightly east of the 1 Stewart, in Block 70, J. H. Belcher Survey, also found pay in the conglomerate at 5,385-5,405 ft. It flowed 60 bbl. of oil in 24 hours and was shut in.

In northwest Montague, Continental Oil Co. 1 L. M. Staley, R. Crawford Survey, 3 miles northwest of Ringgold, recovered 3,700 ft. of oil plus 225 ft. of salt water on a drill-stem test in conglomerate from 5,979-97 ft. Gas came to the top in 4 minutes and oil in 14 minutes. Length of the test was not reported. A second test was being run from 6,022-28 ft. to determine extent of pay. Continental is said to hold some 5,000 acres around the well. In Southwest Montague, 4 miles northwest of Bowie, R. B. Thrift 1 Potter was drilling ahead below 5,147 ft.

Continental 1 Gaines, Section 24, Block 4, H&TC Survey, a west outpost to Ringgold Bend conglomerate field, but in Clay County, reported a show of oil in the Bryson sand (Strawn) at 4,864 ft., and drilled to 4,884 ft. where a drill-stem test was to be made. Star Oil Co., Inc., 1 Conway, north outpost to Shannon Caddo field in south Clay County, was drilling shale below 5,490 ft.

Standard-Fryer Drilling Co., Inc., 2 R. L. Morris, north offset to the company's 1 Morris, recent 4,000-ft. southwest extension well to Chico field of Wise County, encountered heavy gas show in the upper Bend conglomerate. Operators lost circulation at 5,281 ft., then ran a drill-stem test, which brought gas to the surface in 19 minutes. The test was not completed at last report. Completion of the 1 Morris was delayed several weeks by a high gas-oil ratio.

In northern Wise County, Cities Service Oil Co. 1 Monk, north of Alvord, was drilling shale below 7,082 ft. It had the conglomerate at 6,031 ft. Four miles southwest of Boyd, J. M. Hickey 1 Birdwell was drilling in shale and lime at 5,070 ft.

Humble Oil & Refining Co. continued testing its 1-B Daws, 1½ miles west of the Holbert Caddo field in Young County, but had not identified its prospective pay section. Before acidizing with 2,000 gal. at 4,361-71 ft., it had swabbed 194 and 145 bbl. of oil on two 24-hour periods.

Five miles east of Trockmorton, Fred M. Manning, Inc., prepared to complete its 1-B Davis in the Caddo, where a drill-stem test from 4,190-4,210 ft. recovered 220 ft. of oil. Casing was set to 4,270 ft. The wildcat had salt water in the Mississippian, topped at 4,719 ft., and drilled to 4,740 ft. Manning 2 W. R. Watt, E. Dean Survey, 4 miles north of Throckmorton, was drilling below 5,060 ft. and looking for the Mississippian.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Taylor County: Sojourner Drilling Co. 1 D. O. Huddleston, Lge. 147, Grimes CSL, 2 mi. S Merkel, flowed 124 bbl. 40°-grav. oil in 18 hours, ¼-in. choke, perforated Flippen lime 2,783-87 ft., tubing pressure 80 psi., GOR 550 cu. ft., 1-mile N extension to Reidenbach field.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: W. G. Gouchie 1 Grace Bell, Clark & Plumb Sur., 2 mi. SE Archer City, dry, TD 1,798 ft., sand with oil odor 1,157-60 ft.

Baylor County: Wright, Clark & Senkel 1 Farmer "C," Sec. 3,121, TE&L Sur., 1½ mi. NW Westover, dry, TD 3,502 ft. in lime.

Brown County: Varner & Farris 1 W. H. Chambers, Sec. 22, BBB&C Sur., 2 mi. NW May, dry, TD 3,005 ft., Caddo 2,260 ft., Marble Falls 2,570 ft.

Clay County: G. H. Vaughn 1 Hapgood "A," Sec. 1, Brooks & Burleson Sur., 5 mi. NW Bellevue, dry, TD 6,724 ft., Caddo 5,897 ft., conglomerate 6,166 ft., Ellenburger 6,570 ft.

Coleman County: O. H. Grubbs Motor Co. 1 J. W. Brown, Sec. 10, H&TC Sur., 4 mi. SE Novice, dry, TD 3,610 ft., Capps lime 3,115 ft., Jennings sand 3,296 ft., Gardner sand 3,382 ft., Palo Pinto 3,891 ft., elev. 1,936 ft.

Cooke County: Kay Kimbell 1 University, Blk. 8, Lge. 76, University Lands, 1¼ mi. SW Dexter, dry, TD 7,409 ft.

J. R. & Adam Seitz 1 J. D. Walker, B. Lusk Sur., 8 mi. N Muenster, dry, TD 2,101 ft., Ellenburger 2,064 ft.

Eastland County: A. L. Andree 1 Johnny Aaron, Sec. 4, Blk. 3, H&TC Sur., 4 mi. SW Eastland, dry, TD 3,784 ft., Caddo 2,941 ft.

Haskell County: Fain & McGaha 1 J. W. Goode, S. Chance Sur., NE corner of county, dry, TD 5,632 ft., Caddo 5,204 ft., Mississippi 5,545 ft., elev. 1,436 ft.

Jones County: Con Tex Petroleum Corp. 1 M. E. Yeatts, Sec. 8, Blk. 16, T&P Sur., 3 mi. SW Hawley, dry, TD 2,475 ft.

T. D. Humphrey 1 A. L. Gray, Sec. 41, D&DA Sur., 2½ mi. SW Avoca, dry, TD 3,060 ft.

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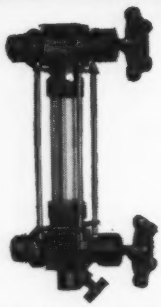

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Lge. 149, Grimes CSL, 5 mi. N Merkel, dry, TD 4,703 ft., reef lime 4,198 ft.

King County: Humble Oil & Refining Co. 43 Bateman Trust, J. B. Rector Sur., 7¼ mi. NE Guthrie, dry, TD 6,631 ft., pre-Cambrian 6,629 ft., elev. 1,726 ft.

Stephens County: J. W. Carter & Co. 1 H. Singleton, Sec. 28, OAL Sur., 5 mi. SW Eolian, dry, TD 4,293 ft., Caddo 3,503 ft., Mississippi 4,289 ft., elev. 1,302 ft.

Throckmorton County: Deep Rock Oil Corp. 1 Nannie Wright, Blk 256, BBB&C Sur., 3 mi. SW Throckmorton, dry, TD 5,233 ft., Caddo 4,356 ft.

PERMIAN BASIN

Standard Oil Tests Deep Pennsylvanian Pay Zone

MIDLAND.—Standard Oil Co. of Texas 1 Jessee Brown, reef limestone discovery in north central Scurry County, at 6,261-72 ft., apparently found a deeper Pennsylvania pay zone, from which it flowed 121.4 bbl. of oil in 5 hours.

A test at 6,272-88 ft. recovered only 40 ft. of oil and gas-cut mud, but a 4-hour test from 6,288-6,313 ft. recovered 410 ft. of oil and 30 ft. of oil and gas-cut mud. Operators then thought it was out of the pay when 16 ft. of oil-cut drilling mud was recovered from 6,313-38 ft.

On the last reported test, from 6,332-58 ft., the well flowed to storage, gaging 26 bbl. of oil the first hour, 22.2 bbl. the second, 25.8 bbl. the third, 24 bbl. the fourth and 23.4 bbl. the fifth hour. The flow was through ½-in. bottom-hole choke, with gas-oil ratio of 1,250 cu. ft. Further tests were being made. The discovery is located 9 miles north of Snyder, and 13 miles northeast of Sun Oil Co. 1 Emil Schattell.

Sun 2 Schattell, ½ mile north and ¼ mile west of the 1 Schattell, apparently was producing from a new pay about 1,000 ft. below the discovery, which produces from 6,868-91 ft. The 2 Schattell first had oil and gas at 7,851-86 ft., and indicated an increase in both oil and gas on a 1-hour drill-stem test from 7,866-96 ft. in unidentified limestone. Recovery was 1,500 ft. of water blanket heavily cut with oil, plus 40 ft. of mud and oil which was 40 per cent oil. No formation water was reported. Corrected gravity of the oil was 38°. Open bottom-hole flowing pressure was 660 psi., and 1,000 psi. shut in.

In Coke County, Sun's third discovery for the county, the 1 P. W. Millican, gaged 390 bbl. of oil in 16 hours after a 2,000-gal. acid treatment. The flow was through ¼-in. choke, with flowing pressures of 1,060 psi. on tubing and 510 psi. on casing. Casing is perforated at 5,958-70 ft.

Borden County had prospects of its first oil production at H. L. Hunt 1 Clayton & Johnson, Section 24, Block 31, T&P Survey, 5½ miles south of Gail. A 2-hour drill-stem test of the section at 6,493-6,523 ft., identified as lower Permian, had gas at the surface in 14 minutes and recovered 1,620 ft. of clean oil, 90 ft. of slightly oil-cut drilling and 90 ft. of oil and gas-cut mud. Gravity of the oil was estimated at 32-34°. Operators then cored gray shale from 6,523-32 ft., and drilled ahead below 6,762 ft.

In Midland County, Gulf Oil Corp. 1-E Bryant, 14 miles south of Midland, recovered 550 ft. of drilling mud and 5,650 ft. of salt water, plus water blanket, on a 2-hour test with packer set at 13,724 ft. It was plugged back and a 6-hour test of the Fusselman from 12,645-767 ft. recovered 540 ft. of gas-cut drilling mud, 2,250 ft. of oil and 210 ft. of salt water.

Texas Harvey Oil Co. 1 Floyd recovered 185 ft. of gas-cut mud on a drill-stem test at 11,323-62 ft., open 3½ hours. It was drilling ahead below 11,390 ft. South of the Midland air terminal, The Texas Co. 1 Scharbauer recovered 90 ft. of drilling mud in 24 minutes at 12,760-967 ft., and was drilling ahead.

I Terry County, Seaboard Oil Co. 1 Hinson, 10 miles northeast of Brownfield, was to plug back from the Ellenburger drilled to 11,845 ft., to around 9,840 ft. and test the Pennsylvanian. The Caddo was also to be tested, which showed for production while drilling at 9,400-05 ft. Last drill-stem test in the Ellenburger, from 11,640-90 ft., recovered 1,030 ft. of water blanket and 9,050 ft. of salt water in 90 minutes. Approximate top on the Ellenburger was 11,600 ft.

Magnolia Petroleum Co. 1-A TXL, northwestern Upton County wildcat, ran a 3-hour test in the Fusselman section of the Silurian at 11,880-940 ft., recovering water blanket plus 30 ft. of slightly gas-cut mud, with no shows of oil. It was drilling ahead.

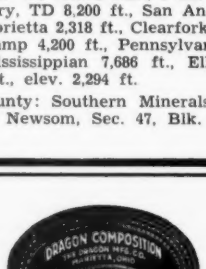
WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Irion County: Frank & George Frankel 1 Tankersly estate, Sec. 7, GC&SF Sur., 4½ mi. from E line and 3¾ miles from S line of county, dry, TD 7,622 ft., Pennsylvanian 7,212 ft., Detrital 7,298 ft., Ellenburger 7,310 ft., elev. 2,290 ft.

Scurry County: American Republics Co. 1 Susie Koonsman, Blk. 2, Sec. 240, H&TC Sur., 11 mi. NE Snyder, dry, TD 7,574 ft., Glorietta 1,770 ft., black shale 5,054 ft., Ellenburger 7,410 ft., elev. 2,172 ft.

McAlester Fuel Co. 1 A. E. Geselle, Sec. 154, Blk. 97, H&TC Sur., 6 mi. SW Snyder, dry, TD 8,200 ft., San Andres 1,530 ft., Glorietta 2,318 ft., Clearfork 2,470 ft., Wolfcamp 4,200 ft., Pennsylvanian 4,780 ft., Mississippian 7,686 ft., Ellenburger 7,898 ft., elev. 2,294 ft.

Terry County: Southern Minerals Corp. 1 M. G. Newsom, Sec. 47, Blk. T, D&W



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Sur., 5 mi. SE Brownfield, dry, TD 5,581 ft., San Andres 4,695 ft., elev. 3,228 ft.

TEXAS PANHANDLE (DISTRICT 10) SUCCESSFUL WILDCAT

Gray County: L. A. Helms 1 A. H. Brown, Sec. 15, Blk. 30, H&GN Sur., 4 mi. N McLean, IP 25 bbl. of oil a day from 2,616-2,716 ft., elev. 2,713 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURES

Lipscomb County: F. D. Hammer 1 Turner, Sec. 541, Blk. 43, H&TC Sur., 3 mi. E Lipscomb, dry, TD 1,050 ft.

Lipscomb County: S. J. Long and O. H. Hammer 1 Wm. Terrel, Sec. 1,125, Blk. 43, H&TC Sur., 4 mi. SW Darrouzett, dry, TD 3,955 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Barnsdall Oil Co. 1-A State, deep wildcat in 23-8s-32e, Chaves County, reported little change in drilling limestone below 11,120 ft. The section is said to be Mississippian. Magnolia Petroleum Co. 1 Turney, dry hole, 23 miles southwest of Roswell in 23-14s-22e, was said to have gone from the Permian section into pre-Cambrian. Total depth was 5,342 ft. Humble Oil & Refining Co. 1 Gorman-Federal, 30-15s-22e, was drilling below 4,829 ft. It topped the Abo section at 3,190 ft.

Eddy County.—Magnolia 2 Burro Hills Unit, 23-21s-22e, was a new 3,000-ft. Glorietta test, 26 miles northwest of Carlsbad. Drilling was under way last week. Magnolia 1 Golden, 29-21s-22e, was drilling at 1,880 ft. R. L. Martin 1 Kerr is a new 2,500-ft. wildcat in 9-22s-27e.

Lea County.—Magnolia was building roads into its location for the 1 T. Betenbaugh, 12,000-ft. test 5½ miles northwest of the Crossroads discovery, in 12-9s-35e. The same company's 1 Cox-Federal, 1-9s-36e, was drilling lime below 4,690 ft.

Uscan Drilling Co. 1 State, 11-18s-36e, was coring hard dolomite below 5,150 ft., with no shows. The Texas Co. 1 McMillan, 3-19s-37e, was drilling below 4,612 ft. A drill-stem test at 3,165-3,408 ft., open 2 hours,

(Continued on page 157)

LA.-ARK.

Catahoula Parish Wildcat Plugs Back, Tests Wilcox

SHREVEPORT.—Hunt Oil Co. 5 Louisiana Delta Hardwood Lumber Co., 5½ miles southeast of the company's Saline Lake field discovery, (Wilcox), in 23-4n-5e, Catahoula Parish, plugged back to the Wilcox at 6,080 ft., from total depth in the Tuscaloosa at 10,650 ft. From perforations at 5,835-45 ft. it flowed 2 per cent oil, 25 per cent salt water and the remainder fresh water. The total amount of flow was not reported. Casing pressure was 180 psi. Operators squeezed and were waiting on cement.

In the Longwood area, Caddo Parish, Phillips Petroleum Co. 1 Hammack, 6-18n-16w, was drilling ahead below 8,603 ft. in the Cotton Valley. Unconfirmed reports indicated the well was capable of flowing from 100,000,000 to 150,000,000 cu. ft. of gas a day, plus 35 bbl. of distillate per 1,000,000 cu. ft., from 43 ft. of porosity in the "D" zone of the Cotton Valley between 8,100-8,200 ft. That eestimate was made after a 15-minute drill-stem test of the interval.

Phillips 1 Ellerbe, 17-15n-12w, Caddo Parish, was coring below 7,200 ft. Five miles northeast of Vivian in 15-22n-15w, The Chicago Corp. 1 Caddo Levee Board recovered 270 ft. of mud cut with salt water and some gas, plus 2,175 ft. of salt water, on a drill-stem test in the Pettit at 5,361-5,466 ft.

In Claiborne Parish, Hunt 1 Goodwin, 21-23-7w, was waiting on orders at total depth of 10,584 ft. Mechanical difficulties apparently have delayed further tests on the distillate zone at 10,160-70 ft. Delta Drilling Co. 1 Meadows, 1-22n-7w, was attempting to drill-stem test from 10,280-10,481 ft.

In DeSoto Parish, northwest of Holly field, E. C. Laster 1 Pegues, 34-15n-14w, flowed a small amount of gas from perforations at 5,150-60 ft., in the Rodessa. Two acid treatments increased the gas flow, which was not estimated, and yielded some distillate and acid water. Additional perforations were made at 5,190-5,200 ft.

Arkansas Fuel Oil Co. 1 Jackson & Purswell, 29-7n-12w, Sabine Parish, had a small amount of gas at 5,275-80 ft., after acid treatment, salt water with a show of gas at 5,263-75 ft. after acid, and plugged back to 4,040 ft.

In Webster Parish, Barnsdall Oil Co. 1 Sykes, 1-22n-9w, was coring the Buckner at 11,088 ft., with no shows reported. Hunt 1 R. P. Campbell, 14-23n-10w, was drilling in the Cotton Valley at 11,013 ft. Stanolind Oil & Gas Co. and Continental Oil Co. 1 Viola Mitchell, 31-23n-9w, plugged back from 11,295 ft. in the Smackover to 10,505 ft. in the Cotton Valley. A drill-stem test of perforations at 10,327-33 and 10,308-20 ft. flowed approximately 1,500,000 cu. ft. of gas a day plus 4 bbl. of 50°-gravity distillate.

In Ashley County, Arkansas, Superior Oil Co. of California 1 Bradley, 11-19s-10w, pumped 49 bbl. of oil a day after plugging back to 5,940 ft. in the Cotton Valley, from total depth in the Smackover at 6,173 ft. Mud content was about 2 per cent. G. H. Vaughn 1 Dennis, 7-16s-21w, Columbia County, was drilling below 7,202 ft.

Stanolind 1 Bodcaw, 29-19s-23w, Lafayette County, was drilling at 11,079 ft. A drill-stem test at 11,047-11,079 ft. recovered the water cushion plus 750 ft. of slightly muddy salt water and 220 ft. of gas-cut salty mud. Stanolind 1 Union Saw Mill, 18-19s-24w, was coring below 10,845 ft. In Nevada County, Hassie Hunt 1 Nels Danielson, 30-

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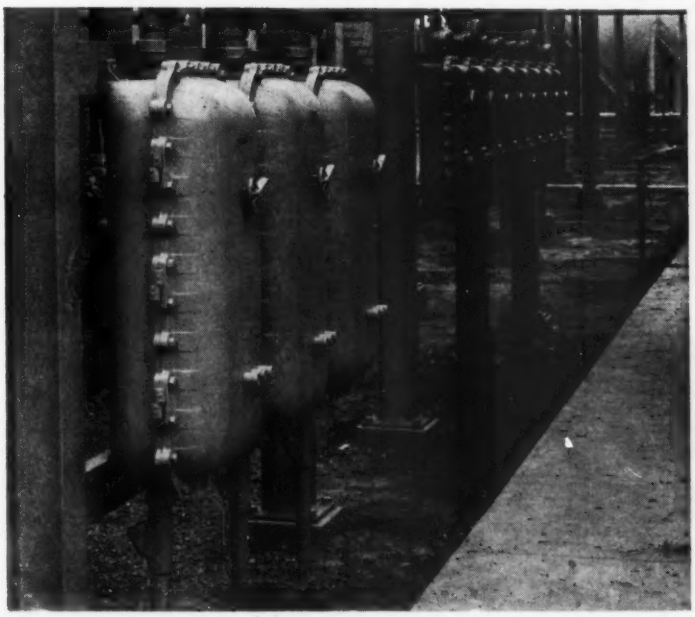

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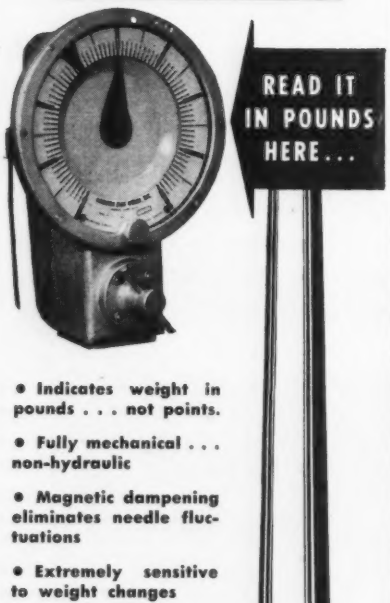

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14s-20w, was drilling in the Cotton Valley at 5,165 ft.

NORTH LOUISIANA WILDCAT FAILURES

DeSoto Parish: A. J. Slagter 1 Calvert, SW SE SW 10-13n-13w, dry, TD 3,526 ft., base annona 1,725 ft., top Paluxy 2,805 ft.

Sabine Parish: McDonald & Cook 1 Long Bell, 30-8n-13w, dry, TD 3,406 ft., Arkadelphia 1,820 ft., base annona 3,240 ft., top Fryburg 3,314 ft.

Skelly Oil Co. 1-B Whitney Corp., NE SW 4-9n-14w, dry, TD 6,822 ft.

ARKANSAS WILDCAT FAILURES

DeSha County: Honolulu Oil Corp. 1 Anderson Tully Co., NE SE 14-9s-1w, dry, TD 4,713 ft., elev. 160 ft.

Ouachita County: Carnes & Milam 1 H. C. Berg, SE SE SE 13-15s-17w, dry, TD 3,445 ft.

Peterson Drilling Co. 2 Dean, SW SE 16-14s-19w, dry, TD 2,317 ft.

KANSAS

Good Oil Well For Webster-West Barry Area

PETROLEUM, INC., has prospects for a good oil well in the area between Webster and West Barry pools in Rooks County. The well, 1 George Veverka, SW SW NW 34-8s-19w, had shows of oil in both Lansing-Kansas City and Arbuckle zones. The Lansing was called at 3,140 ft. and a drill-stem test at 3,179-87 ft. recovered 280 ft. of oil and 30 ft. of oil-cut mud. Another test at 3,208-32 ft. with tool open for 15 minutes, recovered 1,200 ft. of oil and 50 ft. of oil-cut mud. The Arbuckle was topped at 3,380 ft. and casing set on top of the pay. When well was drilled in to 3,382 ft., the hole filled with 1,710 ft. of oil in about 8 hours. Hole was deepened to 3,383 ft. and the well swabbed 44 bbl. of oil in 45 minutes. The well is a little less than ½ mile south of production in Webster pool and about ½ mile northeast of West Barry pool that was opened last July and has had 3 maximum wells completed.

Ellis County has a new pool opener at V. D. Sidney 1 Polifka, NW SE SE 7-13s-17w, a little more than 1 mile northwest of Sugar Loaf pool. Well had a potential of 127 bbl. per day from the Arbuckle which was topped at 3,639 ft. Casing was set on top of the pay and hole drilled to 3,691 ft. but was later plugged back to 3,671 ft.

In Stafford County, Hinkle Oil Co. has run casing for tests of the Lansing-Kansas City and Arbuckle at 1 Copeland, NE NE NE 30-24s-13w. The Arbuckle was called at 4,165 ft. and casing was set at 4,200 ft. The well had a recovery of oil-cut mud on a drill-stem test of the Lansing-Kansas City at 3,720-68 ft. and also had shows in the Arbuckle.

Magnolia Petroleum Co. has staked a wildcat at 1 Hayes, NE NE SE 28-21s-17w, Pawnee County. The location is about 12 miles north of Garfield pool and about 4 miles west of Larned, Kans.

For the week, a total of 65 new locations were recorded with Rice County leading with 10 new spots. Other leading counties were in the following order: Rooks with eight, Barton and Russell with seven each, and Butler, Ellis, and Stafford with six each.

KANSAS SUCCESSFUL WILDCAT

Rooks County: Aylward Drilling et al 1 Marcotte, SE SE SW 18-9s-19w, 91 bbl. of oil per day from Lansing at 3,370-75 ft., TD 3,395 ft.

KANSAS WILDCAT FAILURES

Ellis County: Continental et al 1 Schumacher, NE NE NW 21-13s-20w, dry, TD 3,887 ft.

Marion County: Stormfeltz 1 Stephens, SE SE SE 1-21s-3e, dry, TD 2,718 ft.

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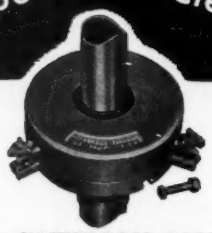

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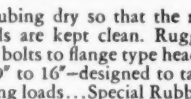

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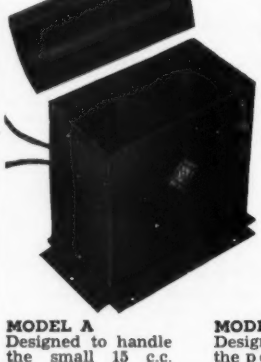

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Reno County: Amerada Pet. Co. 1 Tonn, SW SW NW 11-26s-5w, dry, TD 4,143 ft.
Stafford County: Musgrove Pet. Co. et al 1 Schade, NW NW NE 16-22s-12w, dry, TD 3,702 ft.

OKLAHOMA

New Discovery Well for Okfuskee County

FALCON SEABOARD DRILLING CO. has set casing at the Okfuskee County discovery well, 1 Palmer, NE NW NW 13-13n-8e, following good results from a drill-stem test of the Cromwell sand. Well flowed an estimated 25 bbl. of 39°-gravity oil per hour on test at 3,422-36 ft. Flow was accompanied by gas estimated at 1,000,000 cu. ft. per day. Casing was set to 3,422 ft. and total depth is 3,436 ft.

In the west central part of Pottawatomie County, Cities Service Oil Co. has a Hunton lime discovery at 1 Fleming, NW SW SW 31-9n-3e. Well flowed 117 bbl. of oil in 3 hours from perforations at 4,966-5,021 ft. following a 5,000-gal. acid treatment. Total depth is 5,025 ft.

In Noble County, Howell & Howell and Walter Duncan have found the narrow pay in Ceres pool for a ½-mile north extension at 1 Osborne, SE SW SW 13-23n-1w. The Bartlesville was topped at 4,364 ft. and casing set to 4,372 ft. Operator shot with 80 qt. at 4,375-4,420 ft. and shut the well in for 24 hours. When opened, the well flowed to pits for 5 minutes and was shut in until tanks can be erected for further testing. The area between South Ceres and Southwest Ceres has been drilled so that the pools are now connected. The entire pool has been named South Ceres.

Stanolind Oil & Gas Co. has plugged back at the deep Grady County wildcat, 1 Briscoe, C NW SE 4-4n-5w, for extensive testing of the Springer sands. Casing was perforated with 240 holes at 10,000-60 ft. and a drill-stem test of this section had air at once, gas in 3 minutes, and oil in 3 hours flowing 80 bbl. in 15 hours. Operator has set retainers above and below these perforations and will run tests through perforations further up the hole. The section tested through the first perforations included a zone that had 30 ft. of free oil on a drill-stem test made when the well was drilling. Other Springer sands showed as promising an electric log survey.

Amerada Petroleum Corp. 1 Edwards, NW SE SE 4-4s-4w, Jefferson County, swabbed 94 bbl. of oil and 11 bbl. of water in 10 hours, from the Hoxbar zone through perforations at 2,724-84 ft. and continues testing. The well had good recovery on drill-stem tests at 2,643-2,787 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Carter 1 Pickett-Huffman, NE NE NE 23-2n-3w, flowed 166 bbl. of 44°-gravity oil per day through ¼-in. tubing choke from fourth Deese sand at 7,775-7,814 ft., TD 7,940 ft.
Grady County: Magnolia 1 Powers, C SW NE 29-5n-6w, flowed 337 bbl. of 39.8°-gravity oil per day from Britt sand at 12,110-57 ft., TD 12,493 ft.
Kiowa County: Royal 2 Krieger, NE SW NW 10-6n-17w, pumped 2 bbl. of 37°-gravity oil per day from shale and granite wash at 870-77 ft., TD.
Logan County: Mohawk 1 Marshall, SE SE SE 14-17n-1e, flowed 16 bbl. of 39°-gravity oil per day from Skinner at 4,495-4,505 ft., TD 5,160 ft.
Oklahoma County: Anderson 1 Fisher, NE NE SE 5-12n-1e, pumped 16 bbl. of 41.6°-gravity oil per day from Misener at 5,725-45 ft., TD 5,754 ft.
Pottawatomie County: Vierson 1 Fundis, NW SE SE 28-8n-3e, flowed 55 bbl. of oil per day by heads from Hunton at 4,610-36 ft., TD.

OKLAHOMA WILDCAT FAILURES

Canadian County: Phillips 1 Piedmont, C NW SE 2-13n-6w, dry, TD 9,197 ft.
Cotton County: Bridwell 1 State F, SE SE SE 16-3s-11w, dry, TD 1,630 ft., sand 1,581-82 ft. with slight show of oil.
Logan County: Jordan 1 Briscoe, SE NE SE 3-15n-1e, dry, TD 5,412 ft., Hunton 4,994 ft., Viola 5,235 ft., Wilcox 5,316 ft., second Wilcox 5,388 ft.
Noble County: Ramsey 1 Fireshaker, NE NE SW 1-24n-3e, dry, TD 3,960 ft., Pawhuska 1,218 ft., Oread 1,546 ft., Avant 2,185 ft., Layton 2,490 ft., Layton sand 2,520 ft., Checkerboard 2,910 ft., Big lime 3,055-3,280 ft., Skinner 3,352-65 ft., Mississippi chat 3,527 ft., Mississippi lime 3,572-3,898 ft., Ordovician 3,902 ft., second Wilcox 3,935 ft.
Okfuskee County: Wells 1 Barnett, NE SE NW 9-10n-11e, dry, TD 2,635 ft., Gilcrease 2,627 ft.
Falcon 1 Crane, NW NW SW 29-13n-8e, dry, TD 4,432 ft., Hogshooter 1,160 ft., Layton sand 1,273 ft., Checkerboard 1,604 ft., Oswego 2,570 ft., Prue 2,620 ft., Skinner 2,830 ft., Red Fork 3,020 ft., Inola 3,245 ft., Bartlesville 3,255 ft., Cromwell sand 3,723-90 ft., Mayes lime 3,802 ft., solid Mississippi lime 4,025 ft., Woodford 4,211 ft., Hunton 4,239 ft., Sylvan 4,268 ft., Viola 4,349 ft., dense 4,378 ft., dolomite 4,384 ft., Wilcox 4,403 ft.
Osage County: Texas 1 Osage, NW NE NW 13-23n-3e, dry, TD 4,102 ft., Oread 1,195 ft., Avant 2,165 ft., upper Layton 2,600 ft., Layton 2,780 ft., Checkerboard 3,035 ft., Oswego 3,185 ft., Verdigris 3,415 ft., Mississippi lime 3,696 ft., Woodford 4,003 ft., sand 4,028 ft., Tyner 4,096 ft.
Payne County: Warren 1 Fulton, SW SW NE 2-17n-3e, dry, TD 4,041 ft., Layton

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2,944 ft., Checkerboard 3,170 ft., Oswego 3,614 ft., Bartlesville 3,929 ft.

Blackwell 1 Van Brunt, SE SE NW 21-18n-1e, dry, TD 5,261 ft., Viola 5,121 ft., dense 5,154 ft., dolomite 5,182 ft., Wilcox 5,197-5,224 ft., second Wilcox 5,251-63 ft.

Stephens County: Smith 1 Darity, SW SE SW 17-1s-4w, dry, TD 7,803 ft.

ROCKY MOUNTAIN

Oil Show Near Lodgepole Attracts Attention

DENVER.—Shows of oil in the Wall Creek at the Esperada Mining Co. wildcat northwest of the Lodgepole area again attracted attention to this area of the Powder River basin. The well is 1 Government, C SE SW 16-45n-67w, Weston County, Wyoming, and top of the First Wall Creek was encountered at 6,160 ft. On drill-stem test at 6,160-6,202 ft. the well made 60 ft. of heavily oil-cut mud and 320 ft. of gas-cut mud in 30 minutes. This well is 5 miles northwest of Bay Petroleum Corp's Lodgepole wildcat which caused so much interest in this section of the Powder River basin early last summer. The Bay wildcat tested oil and then oil and water in the Dakota formation and the operator is still attempting to recomplete the well through casing perforations in the top of the sand. There are now several wildcats drilling in this area west and northwest of Mush Creek field.

A month ago Clark Drilling Co. of Billings et al completed a Newcastle discovery well in the Fiddler Creek area, 10 miles northwest of Mush Creek, and Union Oil Co. of California et al are now drilling wells in this area. In the Kuemmerle area, 45n-65w, between Fiddler Creek and Lodgepole, Black Hills Drilling Co. is drilling below 3,000 ft. at 1 Kraft et al, C SW NE 2-45n-65w, on a farm-out deal with Carter Oil Co. Southwest of Lodgepole, E. K. Carey Drilling Co. et al have abandoned a wildcat after failing to find production to 7,500 ft., total depth. The Newcastle and Dakota sands were dry. Leasing and geological activities in this area have been at a high tempo for the past year, and it is expected that much more drilling will be done in an attempt to find other pools similar to Mush Creek and Skull Creek fields.

At the interesting Upper Valley Pennsylvanian discovery in Garfield County, Utah, The California Co. is now reported swabbing some water with total depth at 8,857 ft. This well, 1 Unit, C SW NW 12-36s-1e, topped the saturated limestone at 8,777 ft., and on test between 8,777-91 ft. produced 17°-gravity oil at the rate of 200 bbl. daily. Casing was cemented at 8,765 ft. and the well deepened in the Pennsylvanian to the present depth. The operator is continuing to test and will probably plug back for completion.

At the Shell Oil Co., Inc., wildcat at Ash Creek, Big Horn County, Montana, the operator is now reported fishing at 8,020 ft., total depth. This well is 1 Crow Tribal 7904, NE NE NE 36-9s-37e, and top of Eagle was reported at 4,110 ft. The well is scheduled as a Pennsylvanian test below 10,000 ft., and it is rumored shows of oil have been encountered in the Muddy formation. These reports are not confirmed by the operator. The well is of interest as one of the deepest to be drilled in this part of the Powder River basin, and it is located on a large seismic block assembled by Shell several years ago.

At the deep wildcat test of American Liberty Oil Co. of Dallas on Paradox Valley at 1 Government, C SW SW 10-46n-17w, Montrose County, Colorado, the well is now reported below 7,800 ft. At this depth the well may be out of the Paradox salt section (Pennsylvanian) as some shales have

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been reported. This well is the first to be drilled through the salt in this area, and the outcome of the test is very important for the Colorado section of the large Salt basin. Twenty years ago General Petroleum Corp. drilled three wells on the structure, the deepest to 6,300 ft., and none penetrated the salt zone. The Paradox structure is one of the largest surface structures in this general area and if production is established on this structure it is probable that a number of the other surface structures in the area will be drilled.

Gas has been found by Kerr-McGee Oil Industries, Inc., and Phillips Petroleum Co. on the Garmesa structure at 1 Unit, CWL NE NW 8-8s-102w, Garfield County, Colorado, and the well is now reported below 3,400 ft. in the Morrison. On drill-stem test 2,899-2,976 ft. the well made gas at an estimated rate of 1 million cubic feet daily. Further tests in the lower zones showed as much as 7 million cubic feet daily. The well will be drilled deeper for a test, probably of the Weber formation. Gas in these zones was found by wells drilled on the structure a number of years ago.

New locations.—There were 22 new locations during the week with 12 in Wyoming, 66 in Montana, and 4 in Colorado. In Wyoming, Ohio Oil Co. made location for a shallow test in the Hells Half Acrea area, north of the Boone dome anticline in Nationa County. The well will be 1 Boston-Government, NW NE NE 32-36n-85w. Husky Refining Co. is rigging up rotary for a 5,300-ft. Madison test in the Shoshone area, at 1 Crickett, SE NW SW 21-53n-101w, Park County, northeast of the town of Cody. In the Lightning Flat area, Amerada Petroleum Co. has made location for a second test after recently abandoning a wildcat in the Morrison formation in this area. The new well will be 2 Starr, C SW SE 27-58n-68w, ½ mile north of the first test. Other locations were for pool wells.

Completions. — Twenty - five wells were completed, with a total daily initial of 1,426 bbl. of oil. In Wyoming there were 16 wells completed, 6 in Colorado, and 3 in Montana. The Wyoming wildcat completions included three dry holes and one discovery. The discovery was a deepening to the Cambrian at Sinclair Wyoming Oil Co. 26 Wertz, and this is the second Cambrian producing field in the entire Rocky Mountains. Sinclair made a Cambrian discovery in Lost Soldier field, immediately west of Wertz, several months ago. The Wertz new pay discovery flowed 277 bbl. of oil in 24 hours through tubing, following shooting. The well was deepening from the Tensleep. Southwest of Lodgepole W. C. McBride, Inc., Derby Oil Co., and E. K. Carey Drilling Co. abandoned a deep test after failing to find production in the Newcastle and Dakota sands. Merle E. Morton of Casper et al have abandoned the King dome wildcat in Hot Springs County, at 3,245 ft., total depth, in the Tensleep. Sulfur water was recovered on test of the Phosphoria formation, where light staining was encountered. At Alkali Creek in Niobrara County, British American Oil Producing Co. and Superior Oil Co. have abandoned another attempt to find Dakota sand production on the east side of Powder River basin. In Colorado several small completions were made in the Archuleta County area where shallow shale production was found a year ago. Inland Empire Refining Co. (Phillips Petroleum Co.) has completed the first deep test of the Soap Creek area, Big Horn County, Montana. The well went to granite at 4,470 ft., total depth, and was completed pumping 100 bbl. of oil in 6 hours from a zone between 1,990-2,010 ft.

COLORADO WILDCAT FAILURE

Cow Creek, Montrose County: Arc Drilling & Exploration Co. 1 Wm. Price, center 15-46n-8w, 910 TD, abnd.

MONTANA WILDCAT FAILURE

Soap Creek, Big Horn County, Inland Empire, 5 Indian "L," SW NW NE 34-6s-32e, 4,470 TD, PB 2,069.

WYOMING WILDCAT DISCOVERY

Wertz, Carbon County: Sinclair Wyoming Oil 26 Wertz, NW SE SE 1-26n-90w, 7,785 TD, PB 7,630, flowed 277 bbl. oil in 24 hours from Cambrian through 2⅜-in. tubing. Amsden 6,447, Darwin 6,503, Madison 6,592, Cambrian 7,055, pre-Cambrian 7,768.

WYOMING WILDCAT FAILURES

King dome, Hot Springs County: M. E. Morton and Pilot Oil Co. 1 Govt., NE NE SE 24-44n-97w, 3,245 TD, abnd., Muddy 640, Dakota 850, Fuson 960, Lakota 1,085, Morrison 1,190, Sundance 1,340, Chugwater 1,750, Dinwoody 2,845, Phosphoria 2,915, Tensleep 3,130.

Alkali Creek, Niobrara County: British-American and Superior 1 State-Hill, NW NW SW 10-39n-62w, 5,155 TD, abnd., Pierre 465, Niobrara 3,393, Greenhorn 4,025, Graneros 4,115, Newcastle 4,778-86, hard and tight, Dakota 4,959, Fuson 5,083, Lakota 5,108.

Lodgepole, Weston County: W. C. McBride, Derby Oil and E. K. Carey, C SW SW 29-44n-66w, 7,506 TD, abnd., Newcastle 7,023, Newcastle sand 7,040, dry, Dakota 7,216.

APPALACHIAN FIELD

Deepest Cable-Tool Well Continues Drilling

PITTSBURGH.—In Southwest Pennsylvania, Georges Township, Fayette County, Manufacturers Light & Heat Co. 8 Barton Estate, has resumed drilling after running the 5½-in. casing. The depth of drilling is now 10,133 ft., the deepest yet recorded by cable-tool drilling. In Worth Township, Mercer County, United Natural Gas Co. 1 Lowery Henderson, elevation 1,480 ft., reported the Tully lime at 3,926-63 ft. and the

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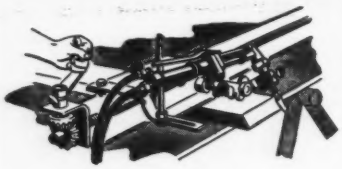

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New locations reported in southwest Pennsylvania were 10: Cowanshannock Township, Armstrong County; Clarion Township, Clarion County; German Township, Fayette County; Armstrong Township, Indiana County; Union Township, Jefferson County; Allegheny, Loyalhanna, South Huntingdon and Washington townships, Westmoreland County.

In Glade district, Webster County, West Virginia, Hope Natural Gas Co. 9227 West Virginia & Pittsburgh R.R. Co., elevation 2,521 ft., logged the Benson sand at 3,590-3,620 ft., and is drilling at 4,043 ft. In Big Creek district, McDowell County, United Fuel Gas Co. 6219 New River & Pocahontas Coal Co., elevtion 1,627 ft., is drilling at 6,473 ft. in the Oriskany sand, the top of which was reported at 6,464 ft.

New locations reported in West Virginia were 14: Sherman district, Boone County; Sherman district, Calhoun County; Ravenswood district, Jackson County; Cabin Creek district, Kanawha County; Harts Creek district, Lincoln County; Lubeck district, Wood County.

CANADIAN FIELDS

Redwater Continues Fast Development

CALGARY.—Redwater this week brought forth bright prospects for a second major oil field in the Edmonton region. Imperial-Redwater No. 4, LSD 3, 14-58-22w4, located about 5 miles northwest of Imperial's discovery well, cored into top of the Devonian lime pay zone at about 3,242 ft., at an elevation indicating some 70 ft. of oil pay lying between top of the zone and the water line. That compares with 140 ft. of pay at the Redwater discovery, drilled on or near the crest of the structure. No. 4 is located down the northwest plunge of the coral reef which is the source of Redwater production and was an assured success when a drill-stem test was run about 9 ft. in the zone, and a flow of oil was brought to the surface 48 minutes after tester was opened. A further 10 ft. was cored, and drill-stem test of the new section was made. During the 1-hour test, there was a recovery of 2,000 ft. of oil in the pipe. At latest report, bottom of the hole was 3,284 ft., with a third drill-stem test being run. Results of latest test had not definitely been reported, but a substantial oil rise had been indicated. Drilling will likely be halted, production string of casing run, and Imperial's second Redwater well will be placed on production.

In the meantime, Imperial's Redwater discovery has run initial open flow potential and has an indicated rate of 1,700 bbl. daily. The well is currently operating on restricted flow between 425-450 bbl. daily. Imperial Redwater No. 3, LSD 9, 11-57-21w4, has surface casing set at 607 ft., currently drilling below 700 ft. Redwater No. 5, LSD 9, 25-57-22w4, is rigging up.

Canadian Gulf Oil Co. and British Dominion Oil & Development Corp., Ltd., have joined forces for exploratory drilling in Alberta. The area selected is Radway, about 40 miles northeast of Edmonton. Canadian Gulf-British Dominion No. 1, LSD 16, 26-59-21w4, which will commence drilling before end of this month, is on a seismograph anomaly picked by Gulf on a Crown reservation worked by that company. The site is about 12 miles north and 2 miles east of Imperial's Redwater discovery well. Estimated maximum depth of the test is approximately 3,500 ft.

The California-Standard Co. has started a second rig to work in the Bantry area, following up the lower Cretaceous oil discovery about 100 miles east and south of Calgary. The new start, Bantry-CPR No. 37-35, LSD 15, 35-17-13w4, ¼ mile southwest of the discovery, was spudded November 8, and has surface casing set at 286 ft. The Bantry discovery well was placed on production last January from a basal Cretaceous sand at about 3,250 ft., and is producing about 1,200 bbl. of 25°-gravity oil net per month through a small diameter choke.

Central Leduc Oils placed their Leduc 6, lower Cretaceous well, on steady production this week, and staked and started drilling at a new site ¼ mile north in LSD 15, 7-51-25w4. No. 6, in LSD 10, 7-51-25w4, rates an initial potential of 34 bbl. hourly on open flush flow. The well is making water-free oil with a low gas-oil ratio, and will probably be operated at about 200 bbl. daily, pending the Conservation Board setting up an allowable policy for the Leduc-Woodbend lower Cretaceous producers.

Western Development Co. of Calgary has

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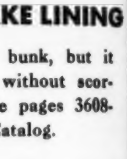

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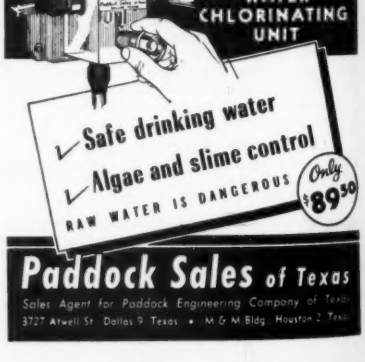

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completed drilling at its first exploratory well, and is now preparing for test of the lower Cretaceous, where gas has been indicated. The well, Western-Vermilion 1, LSD 11, 4-51-6w4, is located near Vermilion in east central Alberta. The Devonian limestone was contacted at 2,120 ft.; total depth of hole is 2,144 ft.

At Pincher Creek, the Canadian Gulf Oil Co. Walter Marr 1 test, LSD 1, 29-4-29w4, is making hole below 9,975 ft., while the company's Fred Shrempp 1, LSD 4, 35-3-29w4, is completing rigging.

CALIFORNIA

Most Angular Well Opens Tidelands Pool

LOS ANGELES.—Marine Exploration Co. has completed its 2 State, 11-5s-12w, in the Seal Beach area of Los Angeles County, for more than 200 bbl. of oil daily to open a new tidelands pool. Referred to as the "most off-vertical hole in the world," the 2 State was completed only after many difficult mechanical problems were solved. One of the most difficult problems in completing was water shut off. During drilling several twistoffs and other mechanical difficulties had to be overcome. The well, completed at a total depth of 12,131 ft., is located on the shore at Seal Beach but is whipstocked far out beneath the ocean. At points the hole is as far as 55° off vertical. Operators were forced to run seven strings of casing in order to drill and complete the well.

The 2 State, however, has proved to be a definite success and has provided a new source of oil. Marine Exploration, in order to prevent other such difficult drilling jobs in developing the pool, currently plans to construct a steel island offshore and drill all remaining wells as straight holes.

Polvadero is the name given to the new field recently opened in the Guijarrel Hills area of Fresno County by Barnsdall Oil Co. Several other ventures are under way in the area, and from present reports it appears that Standard Oil Co. of California will complete the second well in the field. The Standard 35-7F Fee, 35-20s-16e, currently is fishing at a total depth of 8,730 ft. after coring approximately 16 ft. of excellent oil sand. In addition to this near completion, Standard has a shallow well drilling in the area. Other wells under way in the field include: Universal-Consolidated Oil Co. 1 Orr, 2-21s-16e, drilling at 8,725 ft.; Robert Lytle 68-34F Fee, 34-20s-16e, drilling at 7,075 ft.; Barnsdall 84-34 1 Allison, 34-20s-16e, drilling at 7,210 ft.; Barnsdall 31-2-1 Dessell, 2-21s-16e, drilling below 5,620 ft.

Standard of California currently is drilling ahead below 11,200 ft. at its 326-28R UONPR, 28-30s-23e, in the Elk Hills area of Kern County. This venture is a wildcat destined to test the possibilities of deeper zones below the normal Stevens producing zone at Elk Hills, a Naval Petroleum Reserve. According to field reports, nothing of interest has been encountered so far in the lower formations.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Kern River area: Standard Oil Co. of California 1-11-KCL 26, 9-29s-28e, pumped 5 bbl. daily, gravity 11.8°, water cut 28 per cent, elev. 443 ft., TD 1,530 ft.

San Luis Obispo County, Guadalupe area: Continental Oil Co. 3 LeRoy, 2-10n-36w, pumped 84 bbl. daily, approx. 13°-gravity, water cut 2.0 per cent, elev. 18 ft., TD 2,700 ft.

Ventura County, Timber Canyon area: Richfield Oil Corp. 1 E. P. Clark, 13-4n-21w, pumped 36 bbl. in 8 hr., gravity 34.7°, water cut 6 per cent, elev. 2,914 ft., TD 3,853 ft.

CALIFORNIA WILDCAT FAILURES

Los Angeles County, Inglewood area: Centinella Oil Co. 1 Centinella, 4-3s-14w, dry, elev. 85 ft., TD 4,000 ft.

Monterey County, Parkfield area: J. B. Peak 83-22 Colgrove-Taylor, 22-23s-14e, dry, elev. unknown, oil show 1,810-40 ft., casing collapsed, TD 3,201 ft.

San Ardo area: Independent Exploration Co. and Oceanic Oil Co. 1 Thurman, 3-22s-9e, dry, elev. 624 ft., TD 1,785 ft.

San Luis Obispo County, Cuyama Valley area: Richfield Oil Corp. 3 Indian, 23-11n-28w, dry, elev. 1,733 ft., TD 4,774 ft.

Ventura County, Hopper Canyon area: Richards and Rowan 1 Cosby, 14-4n-19w, dry, elev. unknown, TD 3,882 ft.

Moor Park area: Engineers Syndicate, Ltd. 1 Strathearn-Coleman, 12-2n-19w, dry, elev. 785 ft., TD 2,471 ft.

Sulphur Mountain area: Richfield Oil Corp. 2 Freeman, 21-4n-22w, dry, elev. 2,205 ft., TD 4,800 ft.

Southeast New Mexico

(Continued from page 151)

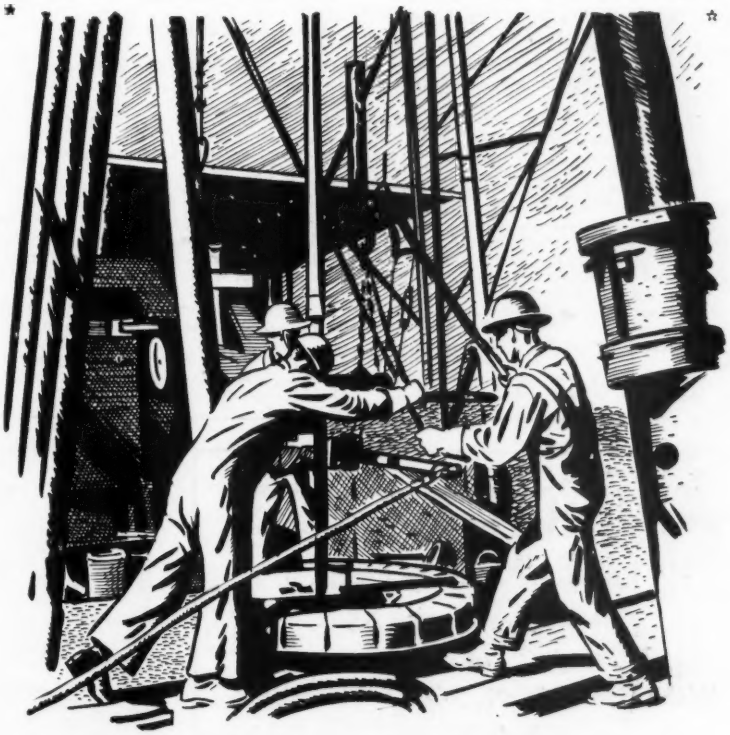
had gas at the top in 13 minutes, estimated at 5,000 cu. ft. daily. At 3,590-3,670 ft. and 3,749-3,838 ft. the recovery was drilling mud with no shows; at 3,838-3,851 ft. the recovery was slightly gas-cut drilling mud.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Magnolia Petroleum Co. 1 Turney-Federal, NW NW 23-14s-22e, dry, TD 5,342 ft., Glorietta 920 ft., Abo 3,130 ft., pre-Cambrian 4,890 ft., elev. 4,075 ft.

Eddy County: Magnolia 1 Foster Unit, SE SW 26-20s-23e, dry, TD 3,502 ft., Glorietta 1,600 ft., elev. 4,077 ft.

Lea County: York & Harper, Inc., 1 Kelly, SE SE 27-19s-33e, dry, TD 3,525 ft., show gas 3,367 ft., base salt 2,900 ft., elev. 3,589 ft., no tops reported.



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MISSISSIPPI

Pure Completes Carthage Point Condensate Well

JACKSON.—In Franklin County, H. L. Hunt 1 W. L. Graves, Section 29-6n-2e, continued to show as a potential field discovery when drill-stem test was run after perforating casing. After casing had been set, operators drilled out cement to 10,596 ft. and perforated 10,578-85 ft. with 42 shots. Several drill-stem tests were run in this interval using 12/64-in. top and ¼-in. bottom chokes. Most estimates were that the well was flowing at the rate of 150 bbl. per day with 3 to 5 per cent basic sediment and water. Gas-oil ratio was estimated at 15,000. Tanks and separator now are being erected prior to final completion.

Pure Oil Co. 4 G. W. Armstrong, 13-6n-3w, in Carthage Point field, Adams County, was completed flowing 150 bbl. of condensate plus 2,247,000 cu. ft. of gas per day through 12/64-in. choke. Gravity is 56.3°. Total depth is 10,269 ft., and production is through perforations at 10,230-58 ft.

In La Grange field, Adams County, Cities Service Oil Co. 1 C. W. Hazlip, 83-7n-2w, has been completed for a potential of 115 bbl. of 40°-gravity oil per day flowing through 14/64-in. choke. Production is through perforations at 6,219-22 ft. Total depth 6,303 ft., with 5½-in. casing at 6,270 ft.

The Mississippi Geological Society adopted "La Grange-South" as a pool name for the area around the Harry W. Elliott 1 Edwin B. Ogden, Section 42-6n-2w, located approximately 2 miles south of production at La Grange field, Adams County. This well was completed September 26, 1948, as a Wilcox producer from perforations at 6,410-18 ft. The well was classified as a pool discovery and not a new field. The new area is considered to be an accumulation in a new sand body on the same structural features as La Grange field.

Four wildcat starts were reported this week, one each in Chickasaw, Issaquena, Rankin, and Wayne counties. Two development locations were reported, one each in La Grange and Pine Ridge fields.

ALABAMA WILDCAT FAILURE

Escambia County: Hunt Oil Co. 9 T. R. Miller Mill Co., Center SE SE 17-3n-11e, dry, TD 6,012 ft.

FLORIDA WILDCAT FAILURE

Suwannee County: J. L. McCord 1-A J. M. Starling, 28-3s-12e, dry, TD 3,817 ft.

ILLINOIS

Christian County Wildcat Tests Devonian

MATTOON.—National Associated Petroleum Co. has set casing and is preparing to test the Devonian at 1 John R. Lawrence, SE NE SE 9-13n-1e, Christian County. Total depth is 2,330 ft. On a drill-stem test at 1,200-40 ft., the well had a recovery of 360 ft. of oil.

In Hamilton County, Ross Bartmess has set casing at 1 Whipple, NW NW SW 23-3s-5e, north of Dahlgren pool, for a test of the McClosky at 3,292-3,304 ft. A 1-hour drill-stem test at 3,282-3,382 ft. recovered 270 ft. of oil cut mud. Casing was set at 3,285 ft. and total depth is 3,382 ft.

In the recently opened pool just south of New Haven, Ashland Oil & Refining Co. et al 2 Egli, E½ SW NE 30-7s-10e, is showing for a better well than the pool opener. The new well is testing Tar Springs sand at

(Continued on page 171)

MICHIGAN

Michigan Reports Active Week

SAGINAW.—Completions in Michigan oil and gas fields last week reached 32, consisting of 17 oil producers for total initial potential of about 5,150 bbl. a day. Six of the smaller producers were Van Buren County producers. Best of the wells were in Osceola and Oceana counties. Three small gas producers were on the list and 9 of the 12 dry holes were wildcats.

Twenty-two locations were announced, four in Arenac County, three in Van Buren, three in Oceana, two in Allegan, two in Bay, two in Crawford, one each in Tuscola, Kalkaska, Kent, Grand Traverse, Osceola and Gladwin counties.

MICHIGAN SUCCESSFUL WILDCAT

St. Clair County, Clay Township: Ray W. Mallock 1 Folkers & Kane, C NE NE 29-3n-16e, 54,000 cu. ft. of gas, TD 344 ft.

MICHIGAN WILDCAT FAILURES

Alcona County, Alcona Township: E. B. Tamblyn Development Co. 1 John and Frances Jozwalk, NW NW NW 33-28n-9e, dry in Detroit River, TD 2,214 ft.

Allegan County, Lee Township: Ohio Oil Co. 1 Russell D. Spurlock, NE NE SW 11-1n-15w, dry in Traverse lime, TD 1,295 ft.

Cheshire Township: Edward R. Theobold 1 Theobold, SW SW SE 26-1n-14w, dry in Traverse lime, TD 1,349 ft.

Bay County, Gibson Township: Ervin Major 1 John Suska, NW NW SW 12-18n-3e, dry, TD 4,304 ft.

Kent County, Gaines Township: Smith Petroleum Co. 1 Frank Dakie, SW SW SE

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9-5s-11w, dry in Traverse lime, TD 1,942 ft.

Kalamazoo County, Alamo Township: Wing Bros. 1 Clarence Sweet, NE NW NW 18-1s-12w, dry in Detroit River, TD 1,880 ft.

Mason County, Summit Township: C. L. Maguire, Inc., 1 E. F. Wallace, NE NE NW 25-17n-18w, dry in Detroit River, TD 2,169 ft.

Pere Marquette Township: Superior Oil Co. 1 Art and Bessie Voss, NE NE NW 6-17n-17w, dry in Detroit River, TD 2,928 ft.

Oceana County, Shelby Township: Carter Oil Co. 1 Anna Babinec, SW SE NE 10-14n-17w, dry in Dundee, TD 2,494 ft.

OHIO, KENTUCKY

Tuscarawas County Gets Good Gas Production

COLUMBUS. — Status Development Co. confirmed the existence of gas production in the area between the towns of Sandyville and East Sparta by a second gas well. Its 1 Chas. H. Rice, Section 3, Sandy Township, Tuscarawas County, found the Clinton at 4,764-4,845 ft. with 1,225,000 cu. ft. of gas natural at 4,797-4,836 ft. After shot the well gaged 1,247,000 cu. ft. when shut in. The company is drilling another test ½ mile to the south.

Allen Willey et al have probably opened another oil pool in Jackson Township, Knox County. Their 1 Bus Moran, Section 19, nearly 1 mile from any production, filled 250 ft. with oil when drilling in and made 47 bbl. in 24 hours after shot. The Clinton sand came in at 2,990-3,039 ft.

H. E. Perkins attempted to extend his oil production at Greer to the east and picked up a nice gas well on George Stitzline property in Section 25, Knox Township, Holmes County. Stray Clinton was topped at 3,010 ft., and at 3,028 ft. gaged 1,400,000 cu. ft.

E. A. Fierbaugh et al are drilling a wildcat on Eliz. Richards, Lot 7, Troy Township, Ashland County. The test is 2½ miles north of the Clouser discovery.

The seasonal decline is setting in on both completions and locations with the exception of Perry County, which has nine new starts reported for the week. Three locations were reported from Lorain County and two each from Knox, Licking, Washington, and Athens counties. Lancaster field led in completions with 6 out of 19.

EASTERN KENTUCKY

ASHLAND.—In Fleming County, Ed Lillie et al 2 John Riley was shut down for orders at 1,800 ft. with hole full of water. Knox dolomite had previously been topped at 1,590 ft. with no shows of oil or gas. Test is located about 1½ miles southeast of town of Hillsboro.

A new location has been announced for the Furnace gas field of northern Estill County and southern Powell County. Test will be that of Petroleum Exploration Co. 1 Walter Shouse in 20-P-68, Powell County.

At Cannel City, Morgan County, Sam Allen et al 1 Thomas Richardson 12-P-65, wildcat test on the Caney anticline, is drilling at 4,115 ft. and expecting the St. Peter-Knox dolomite sequence shortly. Well is on a farmout from Ashland Oil & Refining Co. and is, to date, deepest hole in that vicinity.

WESTERN KENTUCKY

OWENSBORO.—In the area about 11 miles southwest of Owensboro and just west of the town of Jolly, J. C. Miller and Ashland Oil & Refining Co. have Cypress production at 1 J. D. Bennett, 6-N-27, McLean County. Operator swabbed 10 bbl. of oil per hour from pay at 1,970-82 ft. The new well is about 2 miles northwest of Cleopatra pool with 1 well between the pool and the new well.

In Todd County, Fred A. Noah & Sons 1 Vogel, about 2 miles north of Guthrie, had a small show of heavy oil at about 100 ft. and operator has set casing at 97 ft. for further tests.

A. D. Falletti and B. Turner have set casing at 1 George Randolph, 17-P-20, about ¾ mile east of Uniontown pool but separated from the pool by dry holes. A drill-stem test of the Cypress at 2,325-36 ft., with tool open for 1½ hours, recovered 210 ft. of oil, 410 ft. of oil-cut mud, and 900 ft. of salt water.

WESTERN KENTUCKY WILDCAT FAILURE

McLean County: W. E. Hupp et al 1 Arthur Bunch, SW SE SW 6-N-27, dry, TD 2,094 ft.

INDIANA

EVANSVILLE.—Superior Oil Co. has set casing for further tests of the Waltersburg at 2 Ora Smith, SW NW NE 23-3s-12w, Gibson County. Casing was set at 1,804 ft. in the Waltersburg, called at 1,802-09 ft. The well is in the area between Owensville and Fleener pools and is a little more than ½ mile from production in Owensville pool and about 1 mile from Fleener pool. Owensville pool, also called Mounts by some of the local operators, produces from the Waltersburg. Superior 1 Smith, just north of the new well, was dry.

In Vanderburgh County, George E. Baldwin 1 H. E. Boyle, 32-4s-10w, about 8 miles north of Evansville, recovered 300 ft. of gas, 10 ft. of oil, and 140 ft. of oil-cut mud on a 1-hour drill-stem test of the McClosky at 2,289-94 ft. An early test of the O'Hara recovered only mud.

In the southwestern part of Posey County,

(Continued on page 171)

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(Continued from page 65)

brake on the wheels of coercion. I have a feeling that you and I and our associates, in government and out, have been sharing a venture more important than we have realized. During the war I called it an adventure in statecraft, the adventure of free cooperation between a great government and a great industry. At the war's end many of us wondered whether it would work or was wise in peace-time. Two years and more of experience have shown us all that it will work. They have convinced me that the adventure is important in peace as much as in war.

"One thing is notable about all this, the point of the whole matter. Neither the Oil and Gas Division nor the National Petroleum Council nor the Military Petroleum Advisory Board has any authority over anyone, anywhere, at any time. They inform, they advise, they counsel; they do not direct. This is liberty in action, not authority! Do you wonder that I call it an adventure in statecraft?

"No one need follow the advice of the council, the board, or the division, unless it is both good and disinterested. In this lies their strength and their weight. I have watched it work, and here is my opinion: Because they depend on knowledge and reason instead of on directives, the council and the board are among the most influential industry bodies in the United States, and the division is among the more influential government agencies.

Opportunity Unchanged by Election

"We had an election the other day. Some of us were disappointed in the outcome, but our need and our chance for working together have not changed. The peacetime adventure in cooperation began under the present administration, the administration re-elected last week. The wartime adventure was under an administration of the same political faith. What I have said is as good today and tomorrow as it was the day before the election.

"A few men have been afraid of this adventure. They have feared that cooperation with the government would lead to government control. Experience to date has indicated the opposite. We came close to controls last winter, not because we cooperated, but because we could not cooperate fully before the crisis hit; we lacked the legal sanction. We now have the sanction and have organized our cooperation. We could handle a shortage no greater than last winter's with little consumer hardship and little public outcry. We might have had to have controls in California this fall if we had not had cooperation.

"If I read the Book of Experience aright, to avoid the growth of authority we must grow in our use of liberty. If we want government for the people, we must have government of themselves by the people. To avoid discipline by the state we must work with the state to discipline ourselves."

Availability of Foreign Oil Cuts ERP Quotas

(Continued from page 53)

(unchanged); 20,000 kerosine (unchanged); 120,000 gas oil and distillate (unchanged).

Iceland: 15,000 motor gasoline (none); 6,000 kerosine (none); 55,000 gas oil and distillate (none).

Italy: 40,000 bbl. aviation gasoline (75,000).

Netherlands: 16,000 bbl. kerosine (25,000); 200,000 gas oil and distillate (220,000).

Norway: 70,000 bbl. motor gasoline (20,000); 20,000 kerosine (unchanged); 70,000 gas oil and distillate (74,000).

Portugal: 66,000 bbl. aviation gasoline (15,000); 30,000 motor gasoline (unchanged); 10,000 kerosine (15,000); 10,000 gas oil and distillate (25,000).

Sweden: 200,000 bbl. motor gasoline (225,000); 50,000 kerosine (70,000); 200,000 gas oil and distillate (220,000).

Switzerland: 5,000 bbl. motor gasoline (unchanged); 5,000 kerosine (unchanged); 75,000 gas oil and distillate (60,000).

United Kingdom: 110,000 bbl. crude oil (150,000); 305,000 aviation gasoline (390,000); 1,000,000 motor gasoline (1,400,000); 12,000 kerosine (13,000); 800,000 gas oil and distillate (1,100,000).

British West Africa: 18,000 bbl. aviation gasoline (5,000); 40,000 motor gasoline (unchanged); 15,000 kerosine (unchanged); 60,000 gas oil and distillate (64,000).

French North Africa: 35,000 bbl. aviation gasoline (none); 75,000 motor gasoline (120,000); 65,000 gas oil and distillate (120,000).

French West Africa: 15,000 bbl. aviation gasoline (unchanged); 75,000 motor gasoline (unchanged); 15,000 kerosine (unchanged); 10,000 gas oil and distillate (unchanged).

French Oceania: 5,000 bbl. motor gasoline (12,000); 3,000 kerosine (unchanged); 7,000 gas oil and distillate (15,000).

Netherland West Indies: 370,000 bbl. gas oil and distillate (570,000).

Bermuda: None (16,000 bbl. aviation gasoline).

Allocations for non-ECA countries were as follows:

Argentina: 340,000 bbl. crude (400,000).

Bolivia: 6,000 bbl. gas oil and distillate (unchanged).

Brazil: 10,000 bbl. aviation gasoline (unchanged); 140,000 motor gasoline (unchanged); 20,000 kerosine (unchanged); 40,000 gas oil and distillate (unchanged).

Costa Rica: 15,000 bbl. motor gasoline (none); 3,500 kerosine (unchanged); no gas oil and distillate (33,000).

Cuba: 450,000 bbl. crude (unchanged); 30,000 aviation gasoline (35,000); 350,000 motor gasoline (250,000); 2,000 kerosine (unchanged); 50,000 gas oil and distillate (unchanged.

Guatemala: 5,000 bbl. aviation gasoline (unchanged); 12,000 motor gasoline (10,000); 3,000 kerosine (2,500); 5,000 gas oil and distillate (unchanged).

Honduras: 1,000 bbl. kerosine (unchanged).

Mexico: 20,000 bbl. crude oil (21,000); 12,000 aviation gasoline (15,000); 500,000 motor gasoline (450,000); 15,000 kerosine (16,000); 30,000 gas oil and distillate (90,000).

Nicaragua: 15,000 bbl. gas oil and distillate (unchanged).

Paraguay: None (2,000 bbl. aviation gasoline).

Peru: 117,000 bbl. aviation gasoline (none).

El Salvador: 20,000 bbl. motor gasoline (unchanged); 2,000 kerosine (unchanged); 7,000 gas oil and distillate (unchanged).

Australia: 8,000 bbl. aviation gasoline (15,000); 135,000 motor gasoline (220,000); 20,000 kerosine (45,000); 175,000 gas oil and distillate (220,000).

Newfoundland: 125,000 bbl. aviation gasoline (130,000).

New Zealand: 10,000 bbl. aviation gasoline (unchanged); 240,000 motor gasoline (180,000); 8,000 kerosine (unchanged); 50,000 gas oil and distillate (40,000).

Union of South Africa: 25,000 bbl. motor gasoline (20,000); 5,000 gas oil and distillate (unchanged).

China: 200,000 bbl. aviation gasoline (160,000); 300,000 motor gasoline (unchanged); 60,000 kerosine (50,000); 200,000 gas oil and distillate (150,000).

Philippines: 15,000 bbl. aviation gasoline (20,000); 225,000 motor gasoline (220,000); 30,000 kerosine (50,000); 150,000 gas oil and distillate (unchanged).

The OIT reserved for special products 70,000 bbl. aviation gasoline (72,000); 15,000 motor gasoline (unchanged); 2,000 kerosine (28,000), and 140,000 gas oil and distillate (145,000), and put into the undistributed reserve 630,000 bbl. crude (199,000); 299,000 aviation gasoline (115,000); 863,000 motor gasoline (783,000); 103,500 kerosine (76,000), and 965,000 gas oil and distillate (326,000).

Unencumbered Industry Can Provide Enough Oil

(Continued from page 64)

"They have not wasted the nation's resources in their efforts to keep Americans supplied with fuel. Instead they have developed conservation practices which have kept half the oil wells ever drilled in continuous production to this day. They also have made possible the recovery of billions of barrels of crude which, a short 20 years ago, were thought to be forever locked in the ground.

"Continuing improvements in refining have not merely added to our natural resources—they have actually multiplied them. People are getting more and more work out of each barrel of oil.

"All of this, let me remind you, is being done with American know-how by progressive oil men working under the incentive of a reasonable profit. They do the job on their own initiative with private capital, governed by the laws of supply and demand.

"Worried men add up columns of cold figures and come to the conclusion that our oil supply can't possibly last. Other men with imagination, foresight, and indomitable willpower go quietly about their jobs of supplying that oil and expanding its usefulness.

"To make this report the committee experts had to "freeze" oil technology and oil thinking as of the present moment. But technology and thought refuse to be frozen. Under our system of competitive initiative they plunge ahead at an ever-accelerating rate. That is the nature of progress. It is not unlikely that this report, too, will be found conservative when we meet here years hence.

Assumes No Restrictions

"The committee assumed that there will be favorable economic conditions; that adequate materials will be available to carry on its contemplated operations; that there will be no serious interruptions in the industry's activities in the event of war; and that there will be no government regulation of, or restrictions upon, the industry's normal activities.

"Really, it is the last premise which is all-important. If the dead hand of government should descend upon us, for any reason, we would find our production retarded and it would be the beginning of the end of the oil industry as we know it. Under such circumstances, nobody exactly knows what would happen.

"The report itself warns that all bets are off if the government steps in . . . that those estimates of increased availability may have to be revised downward if such a thing happens.

"We must take that warning to heart. The great truth which has been demonstrated by the performance of the petroleum industry of the United States is that progress and increasing usefulness are results of competitive efforts. Our achievement of the past in providing more and ever more oil for America is our most convincing evidence that so long as our form of economy is unimpaired, we will continue to do the job which an industry free of restraint, alone, can do.

"We must fight both to retain our freedom to enterprise and to protect the living standards of the American people. We must convince our friends, our neighbors, our employes, our stockholders, and our customers that they would be enslaved by a regimented economy. We must hammer home, through every medium available to us, that the progressive petroleum industry as it stands today, alone can provide more oil for America."

Report on the Long-Term Availability of Petroleum

(Continued from page 72)

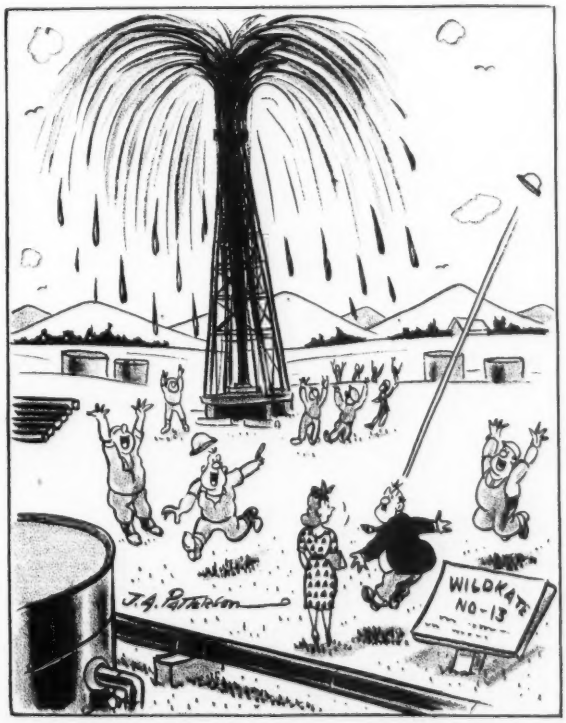
estimates of the availability of natural gas have been prepared other than a consideration of that portion of the gas for conversion into liquid products. However, the relationship of natural gas to petroleum liquids is an important factor in the overall availability of fuels to supply the nation's energy requirements.

The three principal sources of energy in the United States are coal, oil, and natural gas—with water power playing a lesser role. For many uses, these three fuels are directly competitive.

As previously stated, the proved reserves of natural gas have increased steadily, and were estimated at approximately 166 trillion cubic feet at the beginning of the year 1948. These proved reserves are at the relatively high ratio of approximately 30 to 1 to present consumption, and there is no question that availability of this fuel at the producing wells considerably exceeds present distribution facilities. As distribution facilities are expanded, a larger and larger volume of natural gas will be made available to supply over-all fuel needs in this country. To this degree, therefore, natural gas is closely related to the availability of liquid petroleum, and it represents a highly important supplementary source of fuel energy.

Funds Ready for Inquiry

HOUSTON. — The Louisiana board of liquidation of the state debt has appropriated $7,500 for an investigation of the state oil and gas conservation law by the legislature. The inquiry had been previously ordered by the legislature and a committee appointed for the purpose. However, no funds had been provided.



"Is that all it does?"

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED NOVEMBER 13, 1948

	Total of all wells							Wildcat completions and discoveries									
						Cum.							Cumulative total, 1948				
	Comp.	Oil	Gas	Dry	Footage	1948	1947	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	27	14	0	*13	26,044	1,316	1,497	0	0	0	0	0	0	0	0	0	0
Pennsylvania	44	19	5	†20	74,268	2,244	2,695	0	0	0	0	0	0	0	9	14	23
West Virginia	19	2	11	6	40,244	717	765	0	0	0	0	0	3	0	36	43	82
Ohio	19	5	8	‡6	42,560	1,212	1,179	0	0	0	0	0	2	0	10	33	45
Indiana	19	6	0	13	38,335	958	571	3	0	0	7	10	26	0	1	75	102
Kentucky	28	5	14	9	66,737	695	643	0	0	0	1	1	8	0	0	37	45
Illinois	60	40	0	20	158,892	2,177	1,829	2	0	0	5	7	46	0	1	336	383
Michigan	32	17	3	12	73,981	771	808	0	0	1	9	10	16	0	10	234	260
Kansas	51	27	8	16	173,481	2,740	2,379	1	0	0	4	5	53	0	7	380	440
Neb., Mo., Iowa	0	0	0	0	0	9	5	0	0	0	0	0	0	0	0	7	7
Oklahoma	96	65	2	§29	432,752	3,677	3,548	6	0	0	10	16	114	7	27	563	711
Texas	235	141	18	76	984,279	10,424	8,066	3	0	1	40	44	297	28	89	1,792	2,206
North Central (Dist. 7-B & 9)	77	38	2	37	242,084	3,254	2,538	1	0	0	15	16	107	0	13	659	779
West (Dist. 7-C & 8)	50	45	0	5	237,499	2,809	1,966	0	0	0	4	4	61	1	5	200	267
Panhandle (Dist. 10)	21	9	9	3	63,285	565	411	1	0	0	2	3	1	0	3	11	15
Eastern (Dist. 5 & 6)	18	8	3	7	38,117	514	491	0	0	0	5	5	12	2	0	106	120
Gulf Coast (Dist. 2 & 3)	43	21	1	21	272,319	1,631	1,383	1	0	1	11	13	69	20	32	379	500
Southwest (Dist. 1 & 4)	26	20	3	3	130,975	1,651	1,277	0	0	0	3	3	47	5	36	437	525
Louisiana	51	30	4	17	275,035	2,045	1,389	0	0	0	5	5	42	25	8	189	264
Northern	32	20	4	8	88,302	1,383	824	0	0	0	3	3	4	4	2	94	104
Southern	19	10	0	9	186,733	662	565	0	0	0	2	2	38	21	6	95	160
Arkansas	7	3	0	§4	24,277	269	274	0	0	0	3	3	5	0	0	81	86
Mississippi	8	6	0	2	53,895	362	431	0	0	0	0	0	4	1	3	85	93
Southeastern States	2	0	0	2	9,829	48	55	0	0	0	2	2	0	0	0	44	44
Montana	3	0	0	3	8,073	258	260	0	0	0	0	0	4	0	0	20	24
Wyoming	16	9	0	7	66,673	495	223	1	0	0	3	4	25	0	2	62	89
Colorado-Utah	6	3	0	3	9,474	204	182	0	0	0	1	1	2	0	5	44	51
New Mexico	8	5	0	3	36,229	525	465	0	0	0	2	2	4	1	3	50	58
California	63	55	0	8	199,239	2,498	1,755	3	0	0	7	10	108	1	5	297	411
Total United States	794	452	73	269	2,794,297	33,644	29,019	19	0	2	99	120	760	62	216	4,385	5,424
Total previous week	844	488	58	298	2,091,775	32,850	28,314	12	2	3	108	125	741	63	214	4,286	5,304
Total November 15, 1947	705	373	81	251	2,245,120			10	3	3	84	100	612	84	196	3,566	4,458

Service wells included: *13, †18, ‡2, §1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.) Effective September 28, 1948, Phillips Petroleum Co. advanced prices 35 cents per barrel over those shown in above table in fields of southwestern states where it buys. Advance has not been generally met by other buyers.

A.P.I. REFINERY REPORT, WEEK ENDED NOVEMBER 6

	Crude runs, daily avg.	(Thousands of barrels) Production				Stocks at refineries, bulk terminals, in transit and in pipe lines			
District—		Gaso-line†	Kero-sine	Gas & dist. oil	Resid-ual	Gaso-line*	Kero-sine	Gas & dist. oil	Resid-ual
East Coast	887	2,267	326	1,268	1,608	21,567	10,955	25,925	12,072
Appalachian:									
District 1	82	286	49	91	71	2,334	457	1,000	439
District 2	63	201	22	54	99	979	125	250	185
Ind., Ill., Ky.	969	3,285	439	964	1,117	18,685	4,762	12,637	6,398
Okla., Kans., Mo.	418	1,535	133	540	465	8,283	1,583	6,426	3,057
Inland Texas	221	950	97	190	368	3,173	767	1,199	1,248
Texas Gulf Coast	1,414	4,377	662	2,369	1,916	15,921	3,941	15,060	10,582
La. Gulf Coast	424	1,202	408	739	469	5,199	2,345	4,098	3,387
N. La. and Ark.	77	215	48	56	112	1,954	686	720	345
Rocky Mountain:									
New Mexico	14	54	7	12	27	75	25	55	33
Other Rocky Mtn.	150	501	28	202	248	1,779	292	1,615	975
California	881	2,340	168	1,064	2,402	11,428	802	14,165	43,236
November 6, 1948	5,600	17,213	2,387	7,549	8,902	91,377	26,740	83,150	81,947
October 30, 1948	5,626	17,569	2,109	7,679	8,853	91,925	26,565	81,593	‡81,195
November 8, 1947	5,189	16,270	2,089	6,256	8,650	82,007	22,593	63,358	57,172

*Finished and unfinished. †At refineries including natural blended. ‡Revised in Texas Gulf Coast.

Bureau of Mines crude-oil stocks 233,249,000 bbl. as of November 6—up 2,616,000 bbl. One year ago 223,703,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas	$2.65
Kettleman Hills, California*	2.14
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	5.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

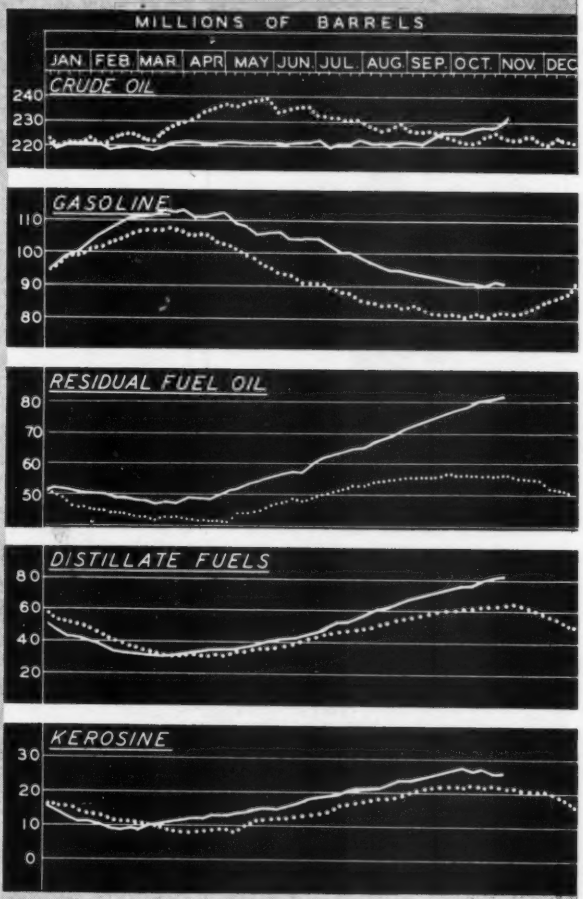
	Nov. 13 crude oil	B. of M. Nov. demand	Nov. 6 crude oil
Alabama	1,350	1,500	1,250
Arkansas	81,900	88,000	80,200
California	960,000	960,000	959,800
Colorado	47,220	48,000	48,910
Eastern	63,000	65,300	65,600
Florida	675	1,000	700
Illinois	178,600	167,000	182,400
Indiana	26,900	17,500	26,200
Kansas	279,450	306,000	295,950
Kentucky	24,500	23,000	24,200
Louisiana	493,700	500,000	490,200
North Louisiana	115,050	.....	111,550
South Louisiana	378,650	.....	378,650
Michigan	42,700	45,000	48,500
Mississippi	129,900	131,000	127,450
Montana	26,830	26,000	24,850
Nebraska	350	700	350
New Mexico	134,605	134,000	134,605
Oklahoma	439,500	436,000	444,050
Texas	2,523,850	2,460,000	2,523,850
Dist. 1 (Southwest)	27,640	.....	27,640
Dist. 2 (Southwest)	177,900	.....	177,900
Dist. 4 (Southwest)	255,050	.....	255,050
Dist. 3 (Gulf Coast)	504,310	.....	504,310
Dist. 5 (Eastern)	51,775	.....	51,775
Dist. 6 (Eastern)	124,875	.....	124,875
East Texas Field	297,500	.....	297,500
Dist. 7-C (West)	48,825	.....	48,825
Dist. 8 (West)	746,825	.....	746,825
Dist. 7-B (W. Central)	57,925	.....	57,925
Dist. 9 (N. Central)	142,525	.....	142,525
Dist. 10 (Panhandle)	88,700	.....	88,700
Wyoming	152,310	150,000	153,650
Total United States	*5,607,340	5,560,000	5,632,715
Change from prev. wk., dn.	25,375		

Total production January 1-November 13 †1,750,092,725 bbl.
Same period last year (crude plus cond.) 1,601,108,890 bbl.

*Not incl. 78,005 bbl. condensate. †Incl. 23,654,380 bbl. condensate.

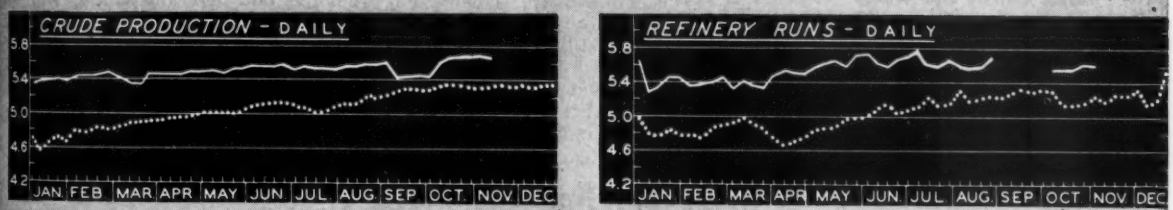
STOCKS IN UNITED STATES

---- 1947 ——— 1948



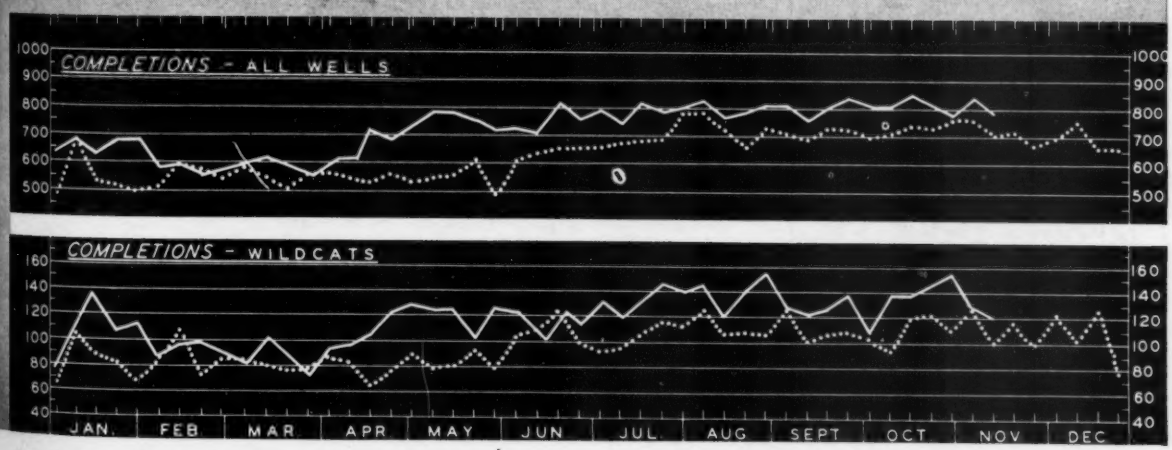
DAILY OPERATIONS

---- 1947 ——— 1948



WEEKLY COMPLETIONS

---- 1947 ——— 1948



PENBERTHY
AUTOMATIC INJECTORS

The accepted method for assuring an uninterrupted supply of feed water to oil field boilers. Penberthy Automatic Injectors will supply feed water to boilers at minimum cost, are quickly and easily installed, reliable under most severe operating conditions, require little attention and no careful handling. Highest quality design and rugged construction.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

BAR-BE-KETTLE
a Man's Gift
In use by many prominent OIL MEN
(names furnished upon request)

IMAGINE—COOKING WITHOUT ANY FLAME

The "Bar-Be-Kettle" Brings You A Time-Tested Cooking Method In Modern Form.

Two Thousand years ago the Chinese roasted their meats by HEAT AND SMOKE ALONE—by placing a lid over their ovens.

The "Bar-Be-Kettle", by means of its lid, uses the same fundamental approach. Heat from charcoal, plus heat from the heavy cast-iron kettle, plus the smoke—all combined give you that perfect barbecue flavor.

Meat is never burned by flames.

"Bar-Be-Kettle" has five parts—kettle, lid, damper and two grills, one for the charcoal in the bottom of the kettle and the other the meat grill.

USE BAR-BE-KETTLE IN YOUR FIREPLACE DURING THE WINTER-TIME.

20" diam., 13" high, weight 90#.

$34.75, less 10% in quantities of four or more, delivered PREPAID parcel post in United States.

W. B. MILLISON COMPANY
Colorado Springs, Colo.

MARKETS

THE weather and spot-market trading of petroleum products over the past week remained generally "mild." Marketers were looking to a sharp decline in temperatures over the nation to put life in some of the presently slow-moving material. Demand and price levels of most products remained unchanged over the past week in most areas.

Demand for natural gasoline was reported "brisk" as its strong consuming season began to make itself known. Some relief in the shortage of high-pressure tank cars which have been tight was seen with the issuing of temporary permits by the Interstate Commerce Commission authorizing the shipment of liquefied petroleum gases in Class 104A and 104A-W tank cars under certain specified conditions.

On the West Coast one major company announced a price increase of 2/10 cent per gallon in its tank-wagon price of automotive gasoline. The new price level was met by two other major suppliers in that area. The first company also announced increases of 4/10 cent in diesel and heating oil prices and 10 cents per barrel in fuel oil.

"Guessing" by observers in marketing circles continued as to whether the crude-oil price increase would become general. The company initiating the price increase has given no indication of backing down and several buyers have reported paying a premium for crude in certain areas in order to get material. An indication that some pressure is being felt by large operators in some areas was made known last week. One major company reported it would post an increase of 35 cents per barrel for the entire state if it were assured not less than 10,000 bbl. per day of East Texas crude, in addition to the amount the company is currently receiving from its present connections.

Mid-Continent Trading Slow

In the Mid-Continent area spot-market trading remained unchanged. Demand for most products continued relatively slack and the situation was not expected to change until winter weather sets in. Products generally were easily available with the exception of kerosine, range oil, and No. 1. These latter materials continued to be held closely despite the fact that the heavy demand for them has not yet begun to be felt.

No. 2 continued to be plentiful and movement slow. Several refiners were reported to be concerned over the heavy storage built up in this material. More of a problem marketwise than No. 2 was heavy residual oil which still was unable to draw any buyer interest and continued to curb some refiners from making normal capacity runs.

Gulf Coast Area

Availability of most products continued good in the Gulf Coast area the past week. Residual fuels, in particular, were plentiful and stocks at uncomfortably high levels. However, kerosine, range oil, and No. 1 remained hard to get, according to some sources. Some easing was apparent in gasoline demand.

Relatively few marketers seemed concerned over the basing-point pricing system. However, some marketing men in the major oil companies pointed out that any change in the method of pricing oil products would take time to put into effect. One official estimated that 2 to 3 months, at least, would be required just to renegotiate contracts with distributors.

Representative Quotations

Representative spot-market quotations of leading suppliers as of November 15, 1948. **Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.**

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10¼-10½	11.6-12* 10.5-11.9†	10¼-11½
Premium gasoline, 78-80 octane	11-11¼	10.6-13.4	11-12¼
42-44 w.w. kerosine	9½-9¾	10.3-11.7	9½-10¼
No. 2 straw fuel oil	9-9¼	9.4-10.1	9-9½
No. 6 residual	$1.70-2.00	$3.03-3.27	$2.20-2.52

*Branded (74-76 octane); †Unbranded (74-76 octane)

NATURAL GASOLINE

	Group 3	North Texas	N. La
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9 9

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12-13.5
750 vis., No. 3-4 neutral	15-16.5
2,000 No. 5-6 neutral	17-18.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	31-33
200 vis. No. 3 neutral, 0-10 pp.	19-21

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	40.5-49
180 vis. p.t. neutral	38.5-47

CRUDE-SCALE WAX

Mid-Continent

132-134 A.M.P.	5½

EQUIPMENT MEN ... in the News

Riley Opens Office As Sales Representative

John C. Riley, Jr., for the past 5 years office manager, A. O. Smith Corp. in Houston, has opened offices in the Scanlan Bldg. in that city. Among the firms that Riley represents as a manufacturers representative are: Midvale Co., Philadelphia; Diamond Saw Works, Inc., Buffalo; Reading Chain & Block Corp., Reading; Electric Steel Foundry Co., of Portland, Ore., and Houston.

Happy Co., Dicusses New Services at Annual Meet

Happy Co., Tulsa, discussed ways and means to better serve the producer, and the improvement and development of new products at a 3-day annual sales meeting held recently, attended by district managers and representatives from Illinois, Kansas, Oklahoma, and Texas. Boston Woven Hose & Rubber Co., for which the company is Mid-Continent distributor, sent representatives to address the group.

Happy Co. has grown from its inception in 1920 as Happy Belting Co. to an organization covering the Mid-Continent. Its real expansion began in late 1937 when atmospheric coolers and pumping units became permanent products. In 1942, the company changed its name to "The Happy Company."

One of Happy's recent contributions to the industry involves a mechanical engine starter composed of a friction pulley, bearings, shaft, sheave, V-belt drive, and a small air-cooled engine. This product is said to eliminate the necessity for air storage tanks, pressure gages, compressors, regulators, valves, piping, and fittings and the physical hazards of starting engines by hand. Paul E. Mahaffey, president, announced that the same policies of the company will be continued.

Pacific Pumps Advances Dunbar and Van Matre

Pacific Pumps, Inc., has appointed Roy A. Dunbar general sales manager, Oil Well Plunger Pump division,

ROY A. DUNBAR

R. C. VAN MATRE

Huntington Park, Calif. Ralph C. Van Matre will succeed Dunbar as general sales manager, Oil Well Plunger Pump division, Mid-Continent division, Tulsa. Dunbar will make his headquarters at Huntington Park. From Tulsa headquarters Van Matre will have charge of sales, service, and stores in the Mid-Continent and Rocky Mountain areas. A. F. Canada, Jr., will continue his present duties as Tulsa district manager, Centrifugal Pump division.

Officials, district managers, and representatives attending annual sales meeting. Back row: "Cotton" Rundle, district manager, Seminole, Okla.; J. B. Allen, Salem, Ill.; Charles Kitch, district manager, Wichita Falls; Francis E. Rhoads, district manager, Salem, Ill.; Ed Allan, district manager, northern Oklahoma; E. L. "Bus" Williams, district manager, Wichita and Ellinwood, Kans.; John Ritter, sales engineer, Odessa, Tex., and "Tex" Theobald, district salesman, Odessa

Front row: Ben Shelton, district manager, Kilgore, Tex.; Leo C. King, vice president and sales manager, Tulsa; Paul E. Mahaffey, president; Bill McCracken, district manager, Odessa

Miller Appointed Division Manager Mud Products

Mud Products, Inc., Tulsa, has appointed Warren Miller as division manager of mud sales and equipment divisions in the Kansas, Colorado, and Panhandle area, with headquarters in Great Bend, Kans. Before joining the Tulsa organization, Miller was vice president and partner of Black Supply Co., of Wichita.

Buda Co. Acquires W. F. Hebard & Co.

Buda Co., Harvey, Ill., has acquired W. F. Hebard & Co., Chicago, manufacturers of materials - handling equipment including "Shop Mule" tractors and lift trucks. Hebard & Co. will be operated as a wholly owned subsidiary with manufacturing being continued at Hebard company.

Bird-Archer Opens Houston Office

Bird-Archer Co. has opened a new office in the M & M Building, Houston, from which Gene W. Clark, C. K. Hoffmeister, and L. W. Stitt will operate. The Houston office will handle all field engineering and laboratory phases of a complete industrial water-treatment service.

Saval Constructs New Buildings

Saval, Inc., Los Angeles manufacturers of Shear-Seal control valves, announces that its production capacity will be doubled by an expansion program now under way. Two new buildings are under construction and new equipment and personnel is being added.

Gun Perforating Service Announced

John Ed Cooper, sales manager for Western Co., Midland, Tex., announces new gun-perforating services for that company. Western's bullet gun is said to be a radically new design making use of the "folded barrel" principle

which gives up to 100 per cent longer barrel and 30 per cent more power than conventional guns.

Mixing Equipment Co. Appoints Representative

Mixing Equipment Co., Rochester, manufacturers of mixing and agitation equipment, has appointed O'Neill Pump & Engineering Co. of Richmond as representative. This firm is headed by T. C. O'Neill.

Swart Made Vice President Security Engineering

K. H. SWART

O. Hammer, president of Security Engineering Co., Inc., announces the election of K. H. Swart as vice president of the firm. Along with the new responsibilities, he will retain his present position as chief engineer. Swart has been with Security for the past 13 years and has been active in the design and development of company products.

Eustice Resigns From W. C. Norris Co.

Joseph H. Eustice, who has been on leave of absence for the past 12 months from W. C. Norris Co., has announced his resignation as president because of continuing ill health. E. C. Bolger, chairman of the board, will assume the duties as president.

Plibrico Opens Offices In Southwest

Plibrico Jointless Firebrick Co., Chicago, has appointed Howard W. Thompson as manager of Philbrico Sales & Service Co. with offices at Fort Worth and Dallas. Thompson will maintain offices at 815½ Throckmorton Street in Fort Worth and in the Santa Fe Building, Unit 2, in Dallas.

Schlumberger Establishes Land-Island Flight

A successful air-service connection was established between land and man-made islands with a helicopter flight made by Schlumberger Well Surveying Corp. between Grand Isle and the Humble Oil & Refining Co. offshore Block 30, State Lease No. 119, Rig 28, in the Gulf of Mexico. The Bell helicopter landed on the deck of the L.S.T. boat, which is itself anchored and connected by a bridge to the drilling platform. R. Henquet, general manager of Schlumberger, was passenger on the helicopter. This step opens a new field of possibilities to the oil industry because of a means of communicating very quickly and safely between islands and shore.

Roger Henquet in helicopter piloted by R. S. Stanbury, Bell Aircraft Corp., landing on deck of L.S.T. at Humble rig in the Gulf of Mexico

Mechanical Manufacturing Names Scott at Houston

W. A. SCOTT

W. A. Scott, Houston, has been named Texas Gulf Coast representative for Mechanical Manufacturing Co., Inc., of Fort Worth, V. H. McKimmey, sales manager, has announced. Scott who has an office in the West Building, Houston, has been connected with the oil industry for 35 years, the last 8 of which have been in the Gulf Coast Area.

Seismograph Service Holds Annual Meeting

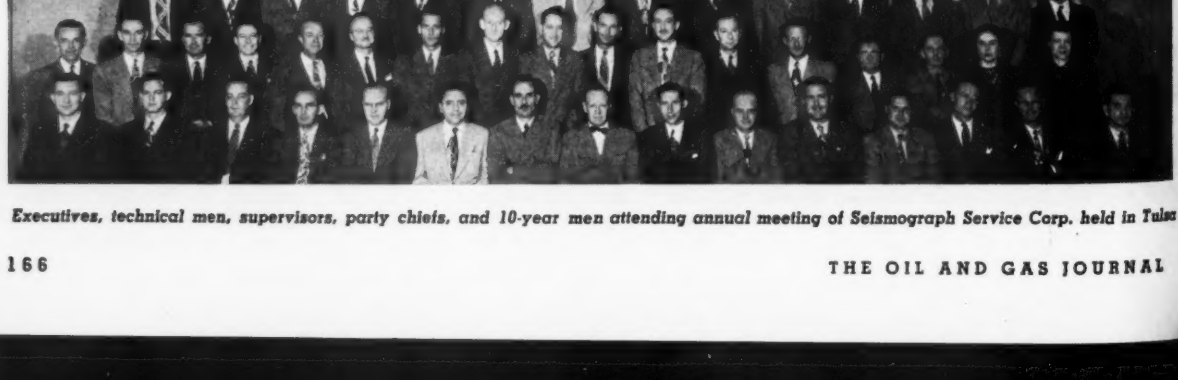
The 17th annual company meeting of Seismograph Service Corp. was held in Tulsa the last of October and was attended by all key and technical men, supervisors, party chiefs, and 10-year men. B. F. Rummerfield, assistant manager of operations in Mexico, was the only representative from the company's foreign operations to attend.

Sessions were confined to company reports covering domestic operations and reports of operations in 13 foreign countries in which company crews are now operating. Discussion of new instruments, techniques, and procedures was also given a prominent place on the program.

The meetings were terminated with a banquet and dance at which service pins were awarded to 35 employes.

Annual meeting of the stockholders of Seismograph Service was held in Tulsa November 1, presided over by Gerald H. Westby, president. Stockholders reelected the entire board of directors: G. H. Westby, T. A. Manhart, A. J. Barthelmes, J. E. Hawkins, A. B. Chappell, J. S. Carlson, G. H. Speirs, G. W. Reed, and R. W. Davis. Two new directors were elected: Laurence D. Simmons, a partner in Laughlin-Simmons Co., and Falkner C. Broach, vice president and a director of the National Bank of Tulsa.

At a board of directors' meeting held immediately following the stockholders' meeting G. H. Westby was reelected chairman of the board.



Executives, technical men, supervisors, party chiefs, and 10-year men attending annual meeting of Seismograph Service Corp. held in Tulsa

Feroe Elected President Beacon Petroleum Co.

J. S. FEROE

J. S. Feroe has been elected president of Beacon Petroleum Co., Tulsa, as announced by the company's directors. H. R. McFarland has been reelected vice president and secretary, and R. E. Bolinger vice president and treasurer. Feroe succeeds E. Q. Beckwith, former president. He was associated with Hanlon-Buchanan, Inc., for 14 years, before the organization of Beacon Petroleum. This company is engaged in marketing natural gasoline and liquefied petroleum gas and its associated equipment, with headquarters in the Wright Building, Tulsa.

National Aluminate Opens Office in Philadelphia

A. H. Webber, district manager, National Aluminate Corp., Chicago, has opened a Philadelphia office in the Independence Building. The company has established a warehouse and stock in Camden. J. F. Reardon and B. J. Lamb are assistants at the Philadelphia office and warehouse.

Continental Supply Appoints Green Refugio Manager

Guy L. Green, Continental Supply Co., at Refugio, Tex., has been named manager of the company's Raymondsville, Tex., store. He replaces G. W. Patterson who has been transferred to Alice, Tex., as field salesman.

McAfee Promoted by Oilwell Supply Co.

William C. McAfee has been promoted to manager of Oil Well Supply Co. store at Mission, Tex. McAfee succeeds Louis C. Hurley, who has joined the production equipment sales department.

White Returns From Europe

Clarence White, president, Oil Well Manufacturing Corp., Los Angeles, has recently returned from a 2-month field trip to Europe. Holland and Norway were included in his itinerary.

King Returns to Elliott Company

M. A. King, formerly manager of engineering, has rejoined Elliott Co. as engineering vice president, Jeannette division. Announcement of his appointment was made by W. A. Elliott, president. King, who had previously been with Elliott for 27 years, was executive engineer for the turbine division of Worthington Pump & Machinery Corp. for the past 5 years.

Pateneaux of A. O. Smith Back From Latin America

G. J. Pateneaux, assistant manager, International division of A. O. Smith Corp., has returned from a 10-month trip to Latin America in which he visited all countries except Paraguay and Costa Rica. His trip was for the purpose of contacting distributors and studying general market conditions. Pateneaux lived and worked for 17 years in Latin America prior to the war.

Oshkosh Motor Truck Appoints Gardner-Price

RALPH GARDNER

HARLEY PRICE

Appointment of Gardner-Price Co., Tulsa, as Mid-Continent representative for Oshkosh Motor Truck, Inc., is announced by J. R. Mosling, sales manager for Oshkosh.

Ralph Gardner and Harley Price, both native Oklahomans, formed the Gardner-Price Co. in May 1948, with headquarters in the Wright Building, Tulsa. They represent other manufacturers serving the oil industry, including the S. Morgan Smith Rotovalve.

Prior to the formation of their company, Gardner was sales manager for Braden Steel Corp., and Price was divisional sales manager of Murphy Diesel Co. for 7 years.

Jessop Steel Promotes Rackley and Gordon

Frank B. Rackley has been made vice president in charge of sales by Jessop Steel Co., Washington, Pa. He was formerly general manager of sales. Before joining Jessop he was in charge of stainless-steel sales at Chicago for Carnegie - Illnois Steel Corp. Curtis A. Gordon, general works manager, has been made vice president in charge of operations. E. E. Bradberry has been appointed assistant manager of sales in Chicago. He was formerly stainless sales engineer in the Chicago office of Carnegie-Illinois Steel Corp.

Trinity Equipment Erects New Plant

Trinity Equipment Corp. has consolidated its general offices and factory in a new building located in Roselle Park, N. J. It will be devoted exclusively to the manufacture of thermowells and metal specialties for the process industry.

Patterson Foundry Appoints Kern to Engineering Post

DONALD Q. KERN

Donald Q. Kern has been appointed director of engineering of the Process Engineering division of Patterson Foundry & Machine Co., New York, where he will direct an expanding program in the design of processes and plants for the petroleum, heavy chemicals, synthetic, and petrochemical fields.

Kern resigned last year from Foster Wheeler Corp. and has since completed a book on process heat transfer which will be published next summer by McGraw-Hill. He has been associated with the graduate school of the Polytechnic Institute of Brooklyn for the last 6 years as adjunct professor of chemical engineering.

Watson-Stillman Appoints Gillespie Sales Manager

J. T. GILLESPIE, JR.

Appointment of J. T. Gillespie, Jr., as sales manager, Watson-Stillman Co., Roselle, N. J., has been announced by A. G. York, vice president in charge of sales. H. E. Elliott, James Wilson, and John B. Bittenbinder will continue as assistant sales managers. Gillespie joined Watson-Stillman in 1944 as director of export sales, in which capacity he remained until appointment to the new post.

Wittich Representative Visiting Venezuela

Fred Jobst left recently for Venezuela in the interest of companies represented by Val Wittich, which include S. R. Bowen Co., Emsco Screen Pipe Co., Houston Slush Pump Co., Miller Sand Pump Co., Texas Iron Works, and Wagner-Morehouse. He will visit major oil operating companies.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FRANKS double drum model 5000 spudder, excellent condition. Mast, lines, tools, dog house, light plant, butane tank. Complete and ready to go. Gleason Drilling Co., Russell, Kansas.

FOR SALE: Wilson well servicing unit, mounted on International truck, complete with line and tools, for depths to 4000'. Excellent condition. Box C-676, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: Fort Worth Super-N ($3225.00) and Fort Worth Model-N ($2225.00) with all tools. Very good condition. Trucks and trailers additional, low priced. C. S. Turet, Great Bend, Kansas. Phone 5082.

FOR SALE: Wilson Master Model Winch powered by 6 MZR Waukesha engine. Unit mounted on one and one-half ton Chevrolet truck equipped with fifty foot single pole telescoping mast. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: One 36-L Bucyrus-Erie Spudder, trailer mounted. Casing tackle equipment. Waukesha motor. Brand new. Latest model. Has never been used. Asking delivery price, no bonus. Telephone 166-J, Mt. Carmel, Illinois.

FOR SALE
USED COMPRESSORS

20—Ingersoll-Rand Belt Driven, Type 10 Compressor Units:
Two stage 5½ x 10½—12" stroke
Two stage 10 x 18—12" stroke
Single stage size range from 6 x 8 to 17 x 12

For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

EQUIPMENT FOR SALE

FOR SALE: Two used WAK Waukesha Engines completely overhauled; one NK Waukesha Engine complete with clutch. Priced to sell. Lesh Drilling Company, Box 305, St. Elmo, Illinois, telephone 261.

FOR SALE: 1,000 ft. 10" casing 40 lb.; 2,500 ft. 8" casing 28 lb.; 3,000 ft. 7" O.D. casing 20 lb.; 4,500 ft. 2" tubing & rods. Will sell pipe in ground or will have it pulled but want to make deal while in ground to save hauling to yard. Arthur Lyke, Hamilton, Kansas.

FAILING MODEL 314-C truck-mounted rig, water truck, Wheatley 6x6 pump, tool trailer, light plant, and complete tools. Most complete rig and low price warrant attention. W. D. Glenn, Box 428, Aurora, Colorado.

FOR SALE: Wilson Super Model Winch powered by 6 MZR Waukesha engine. Terms. Melton Supply Company, Seminole, Oklahoma.

PIPELINE Construction Equipment for Sale: Pipe cleaning machine with priming head, traveling or stationary, 6" to 12", excellent condition, $1,350. Two T40 International tractors with pipelayer attachments, good condition, very cheap. Contact C. W. Sternberg, 8250 Wier Drive, Houston, Texas. Phone Preston 7043.

MURPHY DIESEL, ME-66

Brand New—Sacrifice—At OEM's Cost 1103 cu. in., 6-cylinder, 180 HP, @1200 RPM. Never been used. 20% off list. Contact: Box C-613, The Oil and Gas Journal, Tulsa, Oklahoma.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

NEW CRANE VALVES

Fig. 461, 8", flanged ends, IBBM, Non-Rising Stems. 125# SP, 200# WOG. Price $85.00 each, 10% additional discount in quantities of 10.

AL. BROWN SUPPLY COMPANY
Box 841, Kilgore, Texas

SHOT HOLE DRILLS
LARGE AND SMALL

All are truck mounted, rotary chain pull down, smallest pump size 3½ x 5. Some are in excellent condition, others need repairs. Price FOB Dallas from $3,000.00 to $8,000.00 including truck. For details write 8000 Lemmon Ave., Dallas 9, Texas.

FOR SALE — DANCIGER REFINERY

7,500 Barrel Capacity, 4,000 Barrel Cracking U. O. P.

Complete and up to date made 86 to 87 octane gas for Navy. Approx. 500,000 barrels storage. 3—500 H.P. Heine Boilers installed, one complete new 500 H.P. not installed. Located on approx. 84 acres Longview, Texas. Will lease, or sell entire plant. For inspection see L. D. Shepler at refinery site.

Write—Wire—Phone

W. C. BERRY, OWNER

319 Wright Bldg. **Tulsa, Okla.**

USED SLIM HOLE SLUSH PUMP AND ENGINE UNIT! EXCELLENT CONDITION

6" x 6" Fig. 1036 Wheatley Duplex Pump with Aluminum Frame, 5½" Hardened Steel Liners, Mission Pistons and Piston Rods for slush service; powered by Model HP-217 Buda Oil Field Power Unit. All mounted on steel skid base, with V-Belt Drive and Guard.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

FOR SALE

Four new 1948 Dodge WDX 1-ton Power Wagons. Complete with winch and express (pickup) body. List Price f.o.b. Tulsa.

WIRE — WRITE — PHONE

Century Geophysical Co.
1333 North Utica
Tulsa, Oklahoma
Phone 5-1171

EQUIPMENT FOR SALE

FOR SALE: 3600 feet of 7 inch O.D. 17 lb. oil well casing; 3250 feet of 7 inch O.D. 24 lb. oil well casing. Price Oil Company, 630 E. Town Street, Columbus 15, Ohio. Phone Adams 1489.

FOR SALE: Wilson Mogul draw works powered by G.A.K. Waukesha engine. Good condition, priced for quick sale. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE

Two Diesel Generator Rotary Drilling Rigs, one Waukesha Powered Rig. Complete inventory and prices on request.

CITIES SERVICE OIL COMPANY
Mr. Patridge, Bartlesville, Oklahoma

PRESSURE VESSEL—
REACTION CHAMBER

4' OD x 44' x 4" thickness.

Condition guaranteed.

Priced for immediate sale.

Petroleum Equipment, Inc.
P. O. Box 887 Thrasher Bldg.
Telephone 2-6291 Tulsa, Oklahoma

FOR SALE

24 Trace Model 16-D E.L.I. Seismograph Recorder mounted on 1947 Ford 1½ ton truck (approximately 14,000 miles) complete with 52 Seismometers, 28 Galvanometers, Cables, etc. Like new.

$14,975

F.O.B. TULSA

WRITE:

802 Daniel Building
Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: Model 76 Star Drilling Rig complete w/ 5" & 7" tools. Dietz Drilling Co., 438 N. Elm St., Henderson, Ky.

WELL drilling spudders, beams, light rotaries, core drills, tools, casing. Used equipment at money saving prices. Spang and Mills new tools. Leschen lines. Everything for well drilling. Pressey & Son, Pueblo, Colo.

ROTARY RIG 3,800 ft. Wilson GIANT 7¼ x 12 pump, Waukesha motors, Cardwell derrick (pulls doubles). A-1 shape. Write P.O. Bx. 947, Ada, Oklahoma.

FOR SALE: Two type J 120 Reda Pumps complete with 6500' of cable each. Two extra type V-25 pumps and one extra motor. Three 125 horsepower 300 w.p. straight leg steam boiler with burners and fittings. Excellent condition. Box 4725, Phone 62-6143, Oklahoma City, Okla., Mach-Bridges.

38 D.S. INTERNATIONAL equipped with 29 barrel tank. McDonald pump and other tank cleaning equipment. Box C-666, The Oil & Gas Journal, Tulsa, Oklahoma.

FOR SALE: Cardwell self-propelled drilling and well servicing unit, complete with lines and tools for depths to 4000'. Excellent condition. Box C-675, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE—USED GAS ENGINES

37—Stationary Gas Engines—2 cycle, with Belt Wheels. Make—Bessemer, Foose. Sizes range from 22 H.P. to 80 H.P. For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

FOR SALE

Used Oil Well Casing and Tubing

Now have in stock: 5½ in. casing, 14, 15½, and 17 lb. seamless or lapweld 7 in. O.D. casing, 17, 20, 23, 24, & 26 lb. seamless or lapweld 2 in. tubing upset.

Regular or lapweld 2½ in. tubing upset or regular seamless 10-in. drive pipe or casing.

ALL SUBJECT TO PRIOR SALE

OIL PRODUCERS INC.
314 Murray Bldg.
Grand Rapids, Michigan
Phone: Glendale 49201

USED STEEL TUBING

95,000 ft.	1½" O.D.	Approx. 9 gauge wall
120,000 ft.	2" O.D.	Approx. 11 gauge wall
55,000 ft.	2¼" O.D.	Approx. 11 gauge wall
75,000 ft.	3¼" O.D.	Approx. 10 gauge wall
80,000 ft.	4" O.D.	Approx. 10 gauge wall
21,000 ft.	5½" O.D.	Approx. $\frac{3}{16}$" wall

Single or Double Random Lengths—Plain Ends
Beveled for Welding

Write—Wire—Phone

SONKEN-GALAMBA CORPORATION
2nd and Riverview (K-338) Kansas City 18, Kansas
THatcher 8143

EQUIPMENT FOR SALE

FOR SALE: New Steel Pipe—4" to 14". E. A. Tompkins Co., 2203 E. 28th St., Long Beach 6, Calif. Teleph. 4-5569.

FOR SALE: 12—5½" OD 8 Rd. Thrd. Orbit Fig. A503 3000# test S. E. Steel Drilling Valves. Good as new—$260.00 each. Zanesville Tool & Supply Co., Wooster, Ohio.

10 H.P. BETTIS steamer, mounted on two wheel trailer. Less than 100 hours service. Cheap. Box C-667, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Slightly used 5,000'—3½"—15.50# Spang smls., Grade D, External Upset Internal Flush, Range 2, A.P.I. Drill Pipe with 5" O.D. Oversize Tool Joints, located near Blackwell, Oklahoma. O'Rourke-Baker Drilling Co., 429 Nat'l Bank of Tulsa Bldg., Tulsa, 3, Oklahoma.

FOR SALE: Used Equipment in good condition: 2—6 cylinder Winton gasoline engines—7¼" bore, 8" stroke, 220 H.P. at 1050 RPM, direct connected, General Electric generator, 110 KW, 700 volts, Exciter generator 1½ KW, 64 volts, electric and air starter. 2—Traction motors on 653, G.E. type 240-E, 600 volt, 110 H.P. If interested make offer to J. H. Lauderdale, Missouri Pacific Lines, 1001 Missouri Pacific Bldg., St. Louis, Missouri.

FOR SALE: 300 KW, 375 KVA, natural gas generating unit. Powered by Hope 450 H.P., 5 cylinder engine. Equipment includes engine, generator, exciter, control panels, gas pressure tanks, cooling system. Contact United States Gypsum Co., 300 West Adams Street, Chicago 6, Illinois. Attention R. C. Gimlin.

STEEL TANKS IN STOCK

2—74,000 BBL. LIKE NEW 114' X 48' TANKS ARE CLEAN—AT MORGANTOWN, W. VA.
1—5000 BBL. BOLTED AT NEW YORK
2—1000 BBL. BOLTED AT NEW ORLEANS

DARIEN CORP., 60 E. 42ND. ST., NEW YORK 17, N. Y.

FOR SALE

20—10,000 barrel used closed lapwelded steel tanks, in excellent condition.

Will take contract for erection. Immediate delivery.

A. Greenspon Pipe Co. Inc.
3615 Olive St., St. Louis 8, Mo.
FRanklin 0064 Franklin 1606

WE SOLICIT INQUIRIES

FOR MINIMUM CARLOAD QUANTITIES

NEW PLAIN HOT ROLLED MILD STEEL PLATES—min. 3/16" to 1" inclusive.
NEW PLAIN HOT ROLLED AND ANNEALED MILD STEEL SHEETS—8 gauge to 28 gauge inclusive.
NEW HOT ROLLED MILD STEEL ANGLES—1" x 1" x ⅛" to 6" x 6" x ½" inclusive.
NEW MILD STEEL PLAIN AND DEFORMED ROUND REINFORCING BARS—⅜" to 1¼" inclusive.

All specifications within the range of sizes listed are available. Check with us for early delivery dates.

FABRIKANT
STEEL PRODUCTS, Inc.
11th Floor—Woolworth Bldg., New York 7, N. Y.
BEekman 3-3041
CABLE ADDRESS: FABKANT, NEW YORK
Member: Association of Steel Distributors

EQUIPMENT FOR SALE

FOR SALE: In Kansas, several 94′ and 122′ Angle Iron Drilling Derricks. Inventory and prices upon request. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: One Chicago Pneumatic gas compressor. Size 10 X 10. Type N.S.B. Machine as good as new. Laughner Oil & Gas Co., Box 539, Ambridge, Penna.

1—4,000′ POWER Rotary Drilling Rig complete with 87′ Moore Mast and Subbase. 2 EK Waukesha Motors with extension shafts (V-Belt), excellent condition. 6 x 16 Wilson Snyder Power Pump. 5 Drill Collars, Kelly, Etc. Will sell as one unit or separately. Phone 41213, Wichita, Kansas.

USED Oil Field equipment and supplies direct from reclamation centers. Casing, tubing, linepipe, rods, wire lines, derricks, cable tools and servicing units. Let us quote on your requirements. We help supply some of the industry's large operators. A. R. Kelly, Parkersburg, West Virginia. Phone 7-6292.

FOR SALE: USED PUMPS

19—Geared, Triplex, Outside Packed, Plunger Pumps. Make — National Transit — Denning — Gould; Sizes— 6 x 8, 5½ x 8, 5 x 6, 7 x 10. For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

FOR SALE

12—230 H.P. Type 10 Bessemer New 17″ Power Cylinders complete ready to run with 16″ to 18″ Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

EQUIPMENT WANTED

WANTED TO BUY: One 8″ Standard Landis Pipe-threading Machine. Oilfield Salvage Company, Box 1362, Odessa, Texas.

NEW 5½″ casing 10,000 feet, New tubing 20,000 feet, also larger pipe plain end or threaded and coupled. Line Pipe 2″ or larger, Box 3498, Shreveport, La.

WANTED: Used Cross Reaction Chamber. Approximately 5′ OD x 44′ long. State price, condition, location, enclose sketch. Box C-422, The Oil and Gas Journal, Tulsa, Oklahoma.

USED slush pump without motor; new condition; approximate size 6 x 14. Give description, length of time used, and price. Box 1990, San Benito, Texas.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

FOR SALE

TENNESSEE—88,000 acres, fee $3 per acre; est. 100 mln. ft. timber; full mineral rights; details, E. Jester, 12744 Vanowen, N. Hollywood, Calif. A liquidation.

ALUMINUM PAINT—200—6 gallon cans, Exterior Spar Varnish vehicle. Highly polished, Aluminum Paste pigment in separate container. Distributors Liquidation. Regular price $33.60—take any part, $12.00 per 6 gallon can. Send check with order. The National, 606 Walnut, Kansas City, Missouri.

SERVICES

EXPERIENCED Independent Geological Draftsman will make formational top tracings, etc., of your information by contract. P.O. Box 1884, Tulsa.

HELP WANTED

LEADING manufacturer of oil field equipment is looking for a first-class Mechanical Engineer, if possible with a broad knowledge of field usage of drilling and servicing equipment. Primarily, want man with ability and knowledge to direct and manage engineering program. Applicants should furnish educational background, engineering experience and reference. Address Box C-635, The Oil and Gas Journal, Tulsa, Oklahoma.

THE Production Department of well established growing independent needs a young graduate Petroleum Engineer with one or more years field experience. Time to be devoted to drilling and production. Complete information is desired with first letter, To: Husky Refining Company, Box 380, Cody, Wyoming.

OIL Industry Employment Service, 319 Castle Bldg., Tulsa, Okla. Tom Robinson, Mgr. Phone 4-5974. No fees to pay. Our best client needs six mechanical and civil engineers with one to ten years experience in Gulf Coast area. Good salaries. Needed in Persian Gulf area, Middle East. Division pipeline Superintendent, salary open. Rotary drillers $565. Rotary derrickmen $495. Oilfield welders $420. Write for details.

WANTED: **Seismologist** — For work in Venezuela on a career basis. Must have degree in science or engineering and 3 to 5 years' experience in interpretation of seismograph records. Good salary, living allowance, bonus. Apply by letter or in person, stating age, education, qualifications, etc. Replies will be held strictly confidential. Richmond Exploration Company, 515 International Trade Mart, New Orleans, Louisiana.

OIL FIELD production engineer with capabilities of general superintendent to direct the completion of deep rotary drilled wells. Give record of experience. Initial salary $850.00 per month. Answers held confidential. Box C-679, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES Representative for oil well spudders. Man with oil field background required. This is an unusual opportunity for a man who looks for future security by making a connection with an old, established manufacturer. Only men who have good record behind them need apply. In answering give age, education, experience, and salary requirements. Box C-659, The Oil and Gas Journal, Tulsa, Oklahoma.

W A N T E D

PRODUCTION EQUIPMENT SALESMAN

Salesman for Oklahoma wanted by one of the largest oil tool manufacturers. Experienced in production specialties. Exceptionally good product. State experience and salary expected.

Box C-650

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WANTED

Kansas independent refiner has opening for young, aggressive salesman refined products. Tank car and tank truck delivery to mid-western markets.

Must be familiar with refining operations and equipment using products, especially diesel engines and home burners.

Give age, experience, and references.

Box C-660

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

EXPERIENCED ENGINEERS NEEDED

An American oil company, affiliated with Standard Oil Co. (N.J.) and located in South America needs experienced engineers as follows:

PRODUCING

Petroleum, Electrical, Mechanical, Civil and Construction Engineers and Geologists.

REFINING

Refinery Maintenance and Process Engineers, Designers and Equipment Inspectors.

Degree and three years minimum experience.

• • •

Liberal salaries, other cash payments, retirement plan, paid vacations, excellent opportunities for career work.

• • •

Send details of experience and education to:

Box 308-G

RADIO CITY STATION
New York 19, N. Y.

Replies are held strictly confidential.

WANTED—Field Manager. Geological or Petroleum engineer thoroughly experienced in mud and cuttings analysis techniques for position as field manager with established logging company. Excellent salary and bonus arrangement for the right man. This is an exceptional opportunity and will require an exceptional man, with background of geology, petroleum engineering, logging and managerial ability. Please furnish complete background and references. (Our men know of this ad.) Box C-681, The Oil and Gas Journal, Tulsa, Oklahoma.

MANUFACTURERS AGENTS WANTED

to sell line of drill collar and tool joint thread compounds. Mid-Continent and Rocky Mountain areas. Write for details to:

THREAD COMPOUNDS MFG. CO.
P. O. Box 189 Gardena, California

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

SITUATIONS WANTED

PRODUCTION SUPERINTENDENT. Graduate Petroleum Engineer. Age 35. Experienced Mid-Continent and Rocky Mountain production, drilling, and completion. Previous experience as sales engineer and manager major service company. Now employed in responsible position but desire change due to curtailment of employer's operations. Record and references on request. Box C-671, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE PETROLEUM ENGINEER
Now employed as executive assistant with large producing company. Experienced in technical administrative work. Age 33. Desires position with established oil company or equipment concern. Box C-604, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL locate and buy new and used seamless and lapweld tubing and casing in car load lots for producers or supply company, for commission or salary. Box C-672, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED material or production supervisor wants position with major independent, office or field work. Best of references. Box C-682, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST: Graduate Engineer with ten years seismograph experience as Party Chief and Supervisor over twelve state area desires position in seismic review or interpretation at permanent location. Presently employed as Supervisor of several seismograph crews. If interested, please give general information as to salary and position available. Box C-677, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Petroleum Engineer, experienced in drilling, production, and sales service work desires position as field or sales-service engineer. Available now. Box C-678, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST—6 years experience as geophysical supervisor and coordinator. Ten years interpretation experience. Thoroughly proficient in all phases of interpretation and coordination of geophysical and geological data. Several years experience in review interpretation. Experienced in direction and coordination of extensive exploration program. Excellent record of exploration efficiency and achievement. Desire change with view to better possibilities of advancement. Replies confidential. Box C-669, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY CHIEF CHEMIST, veteran, masters degree, twelve years' experience refinery, three years technical service, desires position with a future. Mid-Continent. Currently employed. Box C-640, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Geologist with approximately 17 years of field study desires connection with an aggressive oil operator. Small salary plus an interest in oil properties acquired. Write: Box C-674, The Oil and Gas Journal, Tulsa, Oklahoma.

PROCESS ENGINEER: B. S. Chemical Engineering. Fluid Catalytic cracking specialist. Experienced in process engineering and plant operations. Desire permanent position in process engineering or operations with refiner needing engineer with catalytic cracking experience. Midwest or southwest preferred. Age 30, married, with family. Presently employed. Box C-673, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION Superintendent 15 years field experience in development and production. Age 37. College graduate. Qualified for field and office supervision of drilling, producing and engineering. Available after January 1st. Box C-670, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

WANTED: ROYALTIES AND PRODUCTION. We are buyers. Send full particulars. Immediate action. Gerber & Company, 120 Wall Street, New York.

LEASE AND DRILLING BLOCKS

830-ACRE block, Osage County, Oklahoma. Near production with four sands 1600 to 2050'. Will farm out block to responsible operator who is financially able to drill several wells and develop block. Box C-652, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Oil and Gas Leases in shallow territory and on structure. Will make flat price on one or more leases, drilling and casing one or more wells. W. P. Harley, Bowling Green, Ky.

TO LEASE for oil 640 acres Reagan County Texas 5 miles S. W. Styles 3 miles north University lands Quarter mile south Centerela on Middle Concher River at Big Rock. L. B. Dougal, 2001 Concourse, Bronx, New York.

TEST WELL to be drilled in Douglas County, Kansas. Excellent geology. If interested write Box C-680, The Oil and Gas Journal, Tulsa, Oklahoma.

A GOOD investment: New 86 acre, 10 year lease, less than one mile from production, active play, Shelby County, Texas. A real bargain. C. A. Parker, Box 451, Center, Texas.

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PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

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No filing with SEC required.

MISSION OIL & MINING CO.
P.O. Box 1387 Tulsa, Oklahoma

BUSINESS OPPORTUNITIES

WILL GIVE LARGE SHARE of acreage I have leased in Grant County, New Mexico, on well defined structure, to party who will finish test well to depth of 2000' or less if oil or gas is encountered. Expect production around 1600'. Large operations planned in near future by several companies. Area has been predicted as "Next Large Oil Discovery in New Mexico." Well drilled about five miles from location had excellent showing gas and oil about 1400'. Francis Seyfried, Box 500, Point Pleasant, New Jersey.

Illinois Fields

(Continued from page 158)

Coy Oil Co. has completed 1 Lynch, NW 2,157-86 ft. and is reported to be swabbing 21 bbl. of oil per hour. The discovery well, Ashland et al 1 Egli, W½ SW NE of the same section, was completed in the Tar Springs with an initial production of 50 bbl. per day.

Producers Pipe Line Co. has an outstanding well in the rapidly expanding North Thompsonville pool in Franklin County. The well, Producers Pipe Line Co. 2 Mandrell, NW NW NW 23-3s-5e, swabbed 890 bbl. per day from the Aux Vases at 3,084-3,111 ft. after a shot of 60 qt. Operator is installing pump.

ILLINOIS SUCCESSFUL WILDCATS

Hamilton County: V. J. Nolan 1 Reed-Twist, SE SE SE 4-4s-7e, IP 18 bbl., Rosiclare, 3,396-3,404 ft., TD 3,507 ft.

Richland County: Calvert & Willis and Aurora Gasoline Co. 1 H. Schneider, NW NW NW 4-4n-14w, IP 64 bbl., McClosky, 3,010-14 ft., TD 3,017 ft.

ILLINOIS WILDCAT FAILURES

Montgomery County: National Associated 1 J. Borger, NE SE SW 36-10n-4w, dry, TD 2,795 ft.

Marion County: P. Doran 1 Garrett, SW NW NW 19-4n-3e, dry, TD 2,422 ft.

White County: Superior Oil Co. 1 L. Smith, NW NE NW 25-3s-8e, dry, TD 3,559 ft.

Effingham County: Callahan & Shaffer 1 Norris, NW NW SW 5-6n-6e, dry, TD 2,683 ft.

Washington County: Pure Oil Co. 1 Brandhorst, SE NE NE 13-3s-1w, dry, TD 2,412 ft.

Indiana Fields

(Continued from page 159)

SE NE 26-7s-15w, with initial production of 60 bbl. per day from the Cypress. Total depth is about 2,470 while information on tops has not been released.

Ashland Oil & Refining Co. et al 1 S. Baehl, NE NW NW 31-4s-11w, has been completed with an initial production of 183 bbl. from the Cypress at 2,190-2,203 ft. This is the southwest offset to the discovery well, George & Wrather and Aurora Gasoline Co. 1 Reimann which was completed about the middle of October.

INDIANA SUCCESSFUL WILDCATS

Gibson County: George & Wrather 1 Ziliak, NE NE SE 18-4s-10w, IP 88 bbl., O'Hara, 2,259-65 ft., TD 2,351 ft. (Discovery well of Warrentown pool).

Knox County: S. D. Jarvis 1 Holsen, SE SE NW 13-1s-12w, IP 104 bbl., Benoist, 2,073-91 ft., TD 2,096 ft. (Extension to Mt. Carmel pool).

Spencer County: R. H. Compton 1 Montgomery-Elbe, SE SW SW 19-7s-7w, IP 35 bbl., McClosky, 1,702-09 ft., TD 1,709 ft. (extension to French pool).

INDIANA WILDCAT FAILURES

Gibson County: Superior Oil Co. 1 Ora Smith, NW NE NE 23-3s-12w, dry, TD 2,705 ft.

Posey County: V. R. Gallagher and Aurora Gasoline Co. 1 H. Rowe, SE NE SE 20-7s-14w, dry, TD 2,961 ft.

Johnston Drilling Co. and Aurora Gasoline Co. 1 A. B. Fogas, SW SW NW 33-7s-14w, dry, TD 2,915 ft.

G. S. Engle 1 Huff, SE SE NW 3-6s-12w, dry, TD 2,317 ft.

Sullivan County: Poe & Elliott 1 Ott Stoop, SE SE SW 17-9n-8w, dry, TD 2,180 ft.

F. B. Cline 1 Robert Green, NW SE NW 14-6n-10w, dry, TD 1,482 ft.

Vanderburgh County: Huber & Huber 1 Charles Brandenberg, NW NE SW 3-6s-10w, dry, TD 2,376 ft.

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CALENDAR OF EVENTS

November

Dallas Geological Society and Dallas Geophysical Society, joint regional exploration meeting, Adolphus Hotel, Dallas, November 18-19.

Rocky Mountain Oil and Gas Association, annual meeting, Cosmopolitan Hotel, Denver, Colo., November 18-20.

American Society of Mechanical Engineers, annual meeting, Hotels Pennsylvania and New Yorker, New York, November 28-December 3.

December

Asphalt Institute, annual meeting, Engineers' Club, New York, December 1.

American Association of Petroleum Geologists, regional meeting, Rice Hotel, Houston, Tex., December 2-3.

Petroleum Electric Power Association, twentieth annual meeting, Biltmore Hotel, Oklahoma City, December 2-3.

National Gasoline Association of America, regional meeting, Amarillo, Tex., December 10.

Interstate Oil Compact Commission, quarterly meeting, Allis Hotel, Wichita, Kans., December 9-11.

1945

January

Society of Automotive Engineers, annual meeting, Book-Cadillac Hotel, Detroit, Mich., January 10-14.

February

American Society for Testing Materials, spring meeting and A.S.T.M. committee week, Hotel Edgewater Beach, Chicago, Ill., February 28-March 4.

March

National Association of Corrosion Engineers, annual convention, Cincinnati, Ohio, March 7-10.

American Petroleum Institute, Southwestern district, Galvez Hotel, Galveston, Tex., March 9-11.

American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa, March 23-25.

New England Gas Association, Hotel Statler, Boston, March 24-25.

Western Petroleum Refiners Association, thirty-seventh annual meeting, Plaza Hotel, San Antonio, Tex., March 28-30.

American Chemical Society, division of petroleum chemistry, spring meeting San Francisco, March 27-April 1.

April

American Society of Lubrication Engineers, annual meeting, Pennsylvania Hotel, New York, April 11-13.

National Association of Corrosion Engineers, Netherlands-Plaza Hotel, Cincinnati, Ohio, April 11-13.

Southwestern Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., April 12-14.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

Natural Gasoline Association of America, annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

American Petroleum Institute, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

May

Independent Petroleum Association of America, mid-year directors meeting, New Orleans, La., May 2-4.

American Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-10.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13.

American Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

June

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 27-July 1.

NOMADS

Houston Nomads, second Monday of each month, The Houston Club, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

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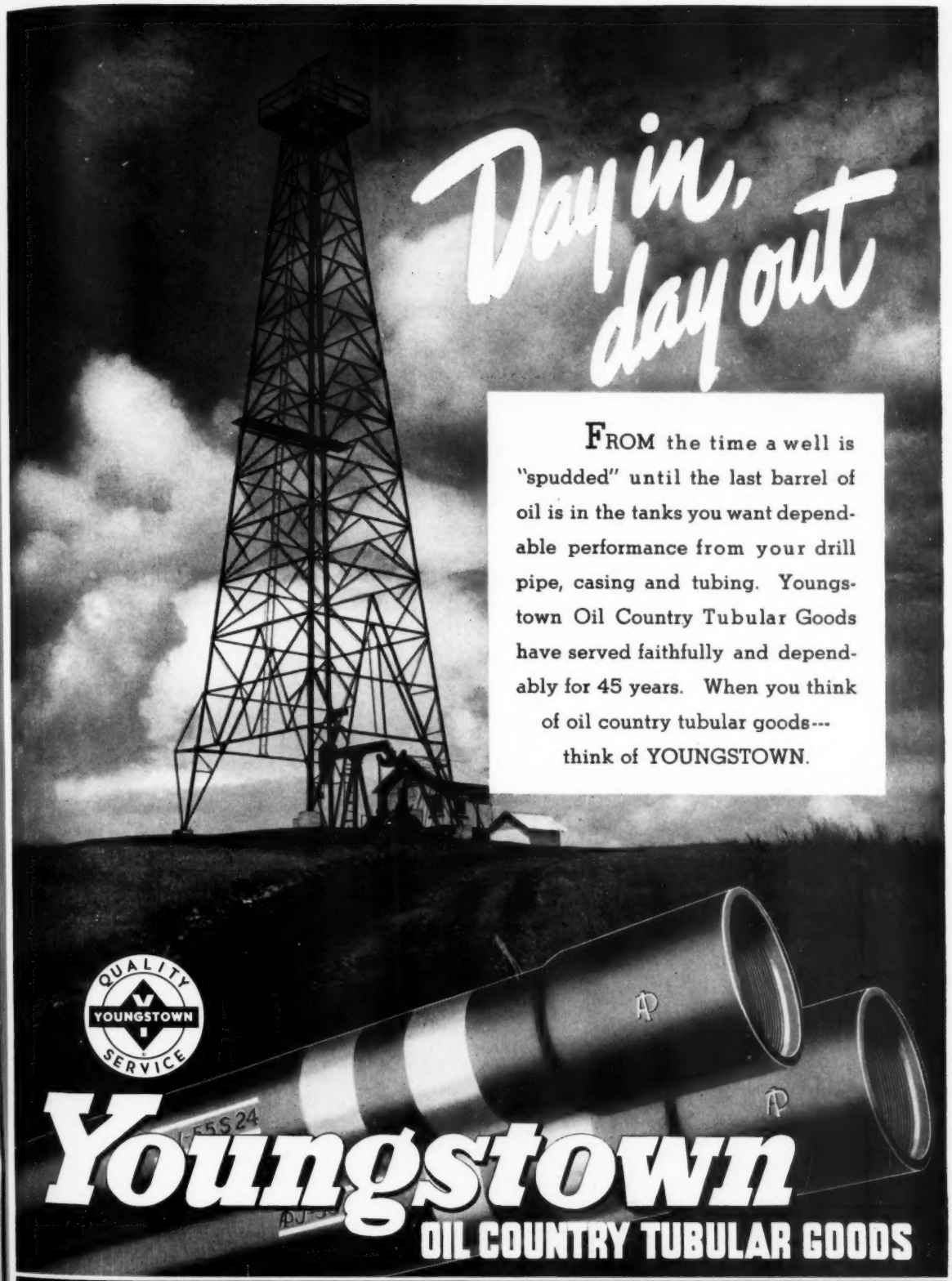
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Bewildered German soldiers viewing synthetic rubber truck tires that failed—constant friction had reduced the Kaiser's World War I "secret weapon" to flat tires! American Petro-Chemistry Science turned Germany's 1918 defeat into a second Allied Victory by perfecting mass production of synthetic rubber in World War II.

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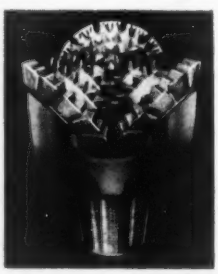

To the American Petro-Chemical Industry goes the honor of achieving a miracle of development and mass production; for, at the end of World War II its annual production exceeded by 68,000 tons the amount of natural rubber consumed by the entire world in 1939! To achieve this miracle, greater crude oil production was necessary - - drilling activity had to be increased. The drilling industry depended on HUGHES ROCK BITS - - trusted in HUGHES know-how in engineering and mass production to supply tools. Forty years' dependable service in this and other emergencies has earned for HUGHES the reputation, "WORLD STANDARD of the OIL DRILLING INDUSTRY."

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